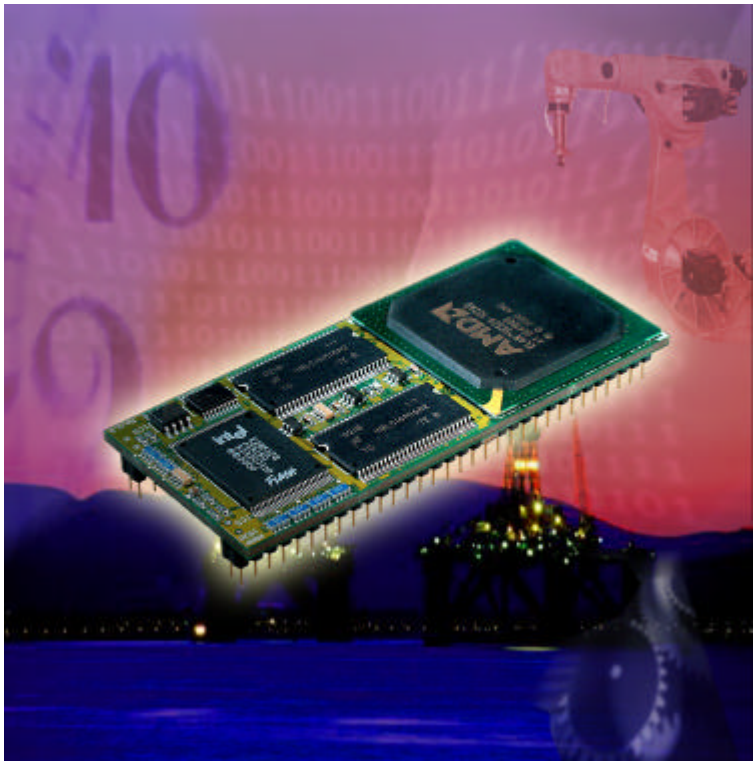


DIL/NetPC ADNP/1520

Starter Kit

User Manual

Content

1 Introduction

Thank you for choosing an SSV Starter Kit. We are confident that you will be pleased with the performance of your product. Please take a few minutes to read this manual. It describes how to start with the DNP/SK10 Starter Kit and will help you to get out the most of your new system.

For further information about the individual components of this Starter Kit you may follow the links from our website at: *http://www.dilnetpc.com*

Our Website contains a lot of technical information, which will be updated in regular periods.

For specific technical information – like hardware description etc. – please check out the Starter Kit CD-ROM, which is an important part of every Starter Kit.

1.1 Conventions used in this Document

Convention	Usage
italic	Filenames, as well as Internet addresses such as www.ssv-embedded.de
italic	User inputs, command lines and pathnames
bold	New terms
`monospace text`	Program code

Table 1-1: Convention usage

1.2 Checklist

Compare the contents of your Starter Kit package with the standard checklist below. If any item is missing or appears to be damaged, please contact SSV Embedded Systems.

Standard Items

Evaluation Board DNP/EVA2-SV4
DIL/NetPC ADNP/1520
Null-Modem cable
Power Supply
Power Cable
User Manual
Support CD-ROM

1.3 Features

Evaluation Board DNP/EVA2-SV4

- 128-pin QIL socket for one DIL/NetPC ADNP/1520
- Three Serial Interfaces, 2x RS232, 1x RS232/485
- 10/100Mbps Ethernet Interface
- Eight User-Definable LEDs
- Eight Manual DIP Switches
- One Reset Switch
- Prototype-Area
- 5 VDC Power Input Connector
- Size 140 x 120 mm

DIL/NetPC ADNP/1520

- AMD SC520 CPU with 133 MHz Clock Speed and FPU
- 32/64 MByte SDRAM Memory
- 16 MByte FLASH Memory
- 10/100Mbps Ethernet Interface
- Real Time Clock
- IDE Support
- Two 16C550 UART Serial Ports
- 20-bit General Purpose High-Speed Parallel I/O
- 7 Interrupt Inputs, 4 Chip Select Outputs
- In-System Programming Features
- 128-pin QIL-Connector
- 3.3 Volt Low Power Design, Single 3.3 VDC Supply
- Size 82 x 36 mm

2 Board Layout

The main component of the Starter Kit is the Evaluation Board DNP/EVA2-SV4. On this board you will find a 128-pin QIL socket (QIL = Quad In Line) to mount your ADNP/1520.

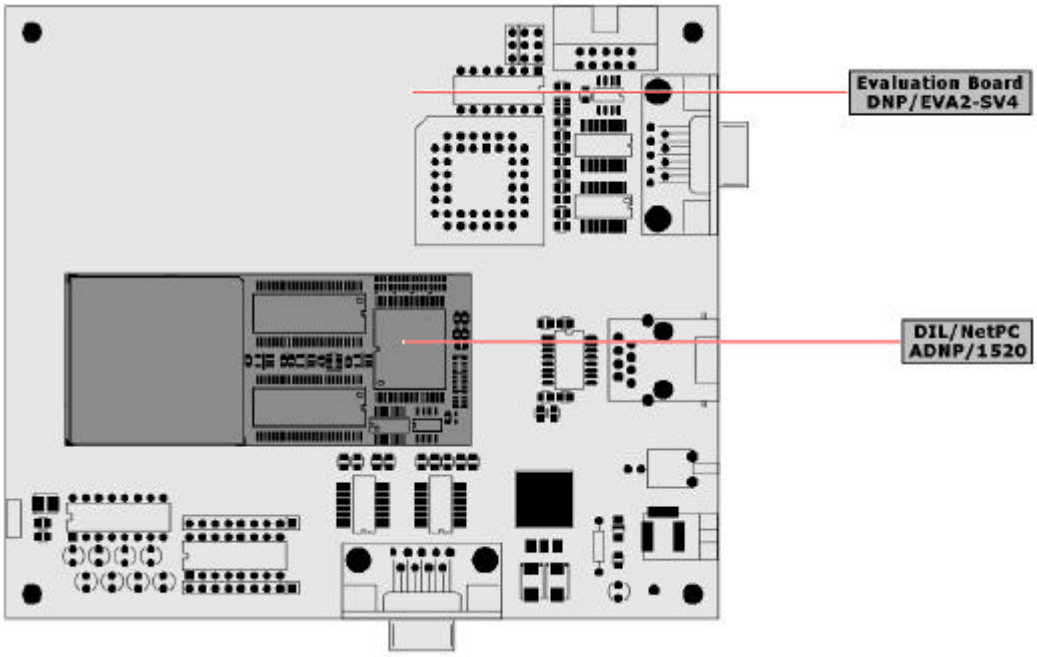


Figure 2-1: Evaluation Board EVA2 with ADNP/1520

The Starter Kit DNP/SK10 provides all required basic hard- and software environment, which allows you the development of individual applications for your ADNP/1520. For an instant connection to your hardware the Evaluation Board supports a serial COM interface, a 10/100Mbps Ethernet interface as well as a QIL-128 interface. Further you will find a prototype (wire-wrap) area, eight LEDs, DIP-switches and one reset switch, which allows you to test your peripheral applications very easy. With the prototype area you have an good place to install and to test your own applications on the Evaluation Board.

3 Board Components

This chapter describes the most interesting components of the Evaluation Board DNP/EVA2-SV4 and gives a short overview about their respective functions.

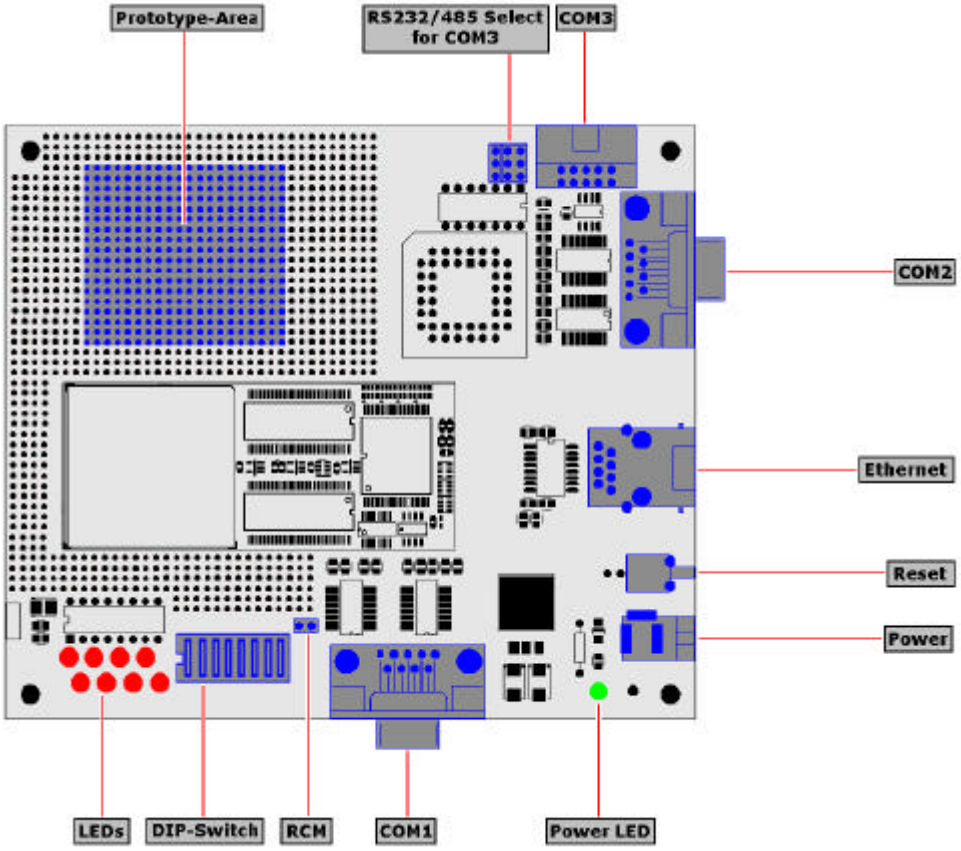


Figure 3-1: Main components of the Evaluation Board DNP/EVA2-SV4

The Evaluation Board offers a single 128-pin QIL socket (QIL = Quad-In-Line). This socket picks up your ADNP/1520 and builds the interface to the individual parts on the Evaluation Board.

3.1 Power Connector

The Power connector onto the Evaluation Board has to be connected with the power supply, which is added to your Starter Kit. Alternatively you are able to use a similar power supply that provides +5V $DC^{\pm}$ 10% and about 2A current.

3.2 Power LED

The Evaluation Board DNP/EVA2-SV4 is equipped with a single green LED. This LED will light up when the board is provided with the necessary operating voltage.

3.3 Output LEDs

The Evaluation Board provides eight red LEDs for testing purposes. These LEDs are the first little application for the PIO-Ports. The LEDs will flicker or light up to indicate traffic on the output ports PA0–PA7.

3.4 DIP Switches

The Evaluation Board has a set of eight DIP-switches. The DIP-switches give you the possibility to put 8-bit binary numbers to the input ports PB0–PB7. The DIP-switches are the second little application for the PIO ports.

Switch open = Signal Vin Low (GND)
Switch closed = Signal Vin High (Vcc)

3.5 Reset Button

Next to the Power connector you find the Reset button. Press it down if the system hang or you need to restart it. Pressing the Reset button will only restart the ADNP/1520. To reset any connected devices please turn off the complete power from the system.

3.6 Prototype Area

The Prototype Area offers space to develop your own applications and circuits on the Evaluation Board.

3.7 RCM Jumper

Use this jumper to activate the RCM mode of the ADNP/1520. To activate the RCM mode place a jumper cap on both pins of the RCM jumper, so that it is short. If you remove the jumper cap, or place the jumper cap on just one pin, the jumper is open and you are not able to use the RCM mode. When closed, you will see some boot messages on the serial port COM1. If the RCM jumper is not set, these messages will be blocked by the system. Please see Appendix 2 - RCM Jumper for more information.

3.8 10/100Mbps Ethernet Interface

The ADNP/1520 is using a SMSC LAN91C111-NE chip that allows Ethernet connectivity with a speed up to 100Mbps. The RJ45 Ethernet interface on the Evaluation Board is just a simple connection over a transformer to the QIL interface pins, which are connected to the LAN controller onto the ADNP/1520.

3.9 Serial Interface COM1

For an easy connection between the Starter Kit and your development system you can use the serial interface COM1. The COM1 interface is realized as a RS232 standard compliant Sub-D port with 9 pins. The exact layout of the COM1 interface is shown in Appendix 2 - COM1 Connector.

3.10 Serial Interface COM2

The COM2 interface is realized as a RS232 standard compliant Sub-D port with 9 pins. The exact layout of this interface is shown in Appendix 2 - COM2 Connector.

The COM2 interface uses the dual UART, which is connected to the ADNP/1520. This UART can only be used in addition to a specific BIOS version that you can find on the Starterkit-CD. On default the UART will not be initialized.

3.11 Serial Interface COM3

The COM3 interface is realized as a RS232 standard compliant 10-pin boxed header. The exact layout of the COM3 interface is shown in Appendix 2 - COM3 Connector.

This interface can be used also as a serial interface with RS485 signal level. To switch between the modes use the jumper block JP1/JP2. In RS485 mode only the pins 3 and 5 are active. The other pins have no function while running this mode. Please don’t close this jumper in RS485 mode.

3.12 COM3 RS232/485 Mode Switch

Use this jumper to select the data mode of the COM3 interface. For the COM3 interface it is possible to use the RS232 mode or the RS485 mode. The RS485 mode uses the same pins like the RS232 mode. For further information please see Appendix 2 - COM3 RS232/485 Switch.

3.12.1 Using COM3 in RS232 Mode

To use the COM3 port in RS232 mode, please set the Jumper JP1 on position 1–2 and the jumper JP2 on the positions 1–3 and 2–4 to select the RS232 data mode. The table below show you these settings.

JP1	JP2	
1 2	1 3	2 4
3	5	6

Table 3-1: Jumper Settings to use COM3 in RS232 mode

3.12.2 Using COM3 in RS485 Mode

To use the COM3 port in RS485 mode, please set the Jumpers JP1 on position 2–3 and the jumpers on JP2 on the positions 3–5 and 4–6 to select the RS485 data mode.

JP1	JP2	
1	1	2
2 3	3 5	4 6

Table 3-2: Jumper Settings to use COM3 in RS485 mode

4 Connections

For a quick and easy start with the DNP/SK10 Starter Kit there are several connections necessary. The following chapter describes, how and between which components these connections have to be made.

4.1 Mounting the ADNP/1520

To mount the ADNP/1520 on the Evaluation Board DNP/EVA2-SV4 identify the pin-1 corner on the socket and the pin-1 corner on the ADNP/1520. On the ADNP/1520 a white sign marks the pin-1 corner. Matching the pin-1 corners, drop the ADNP/1520 down into the socket. There is only a little bit force required and the ADNP/1520 should seat easily into the socket. This locks the ADNP/1520 in place.

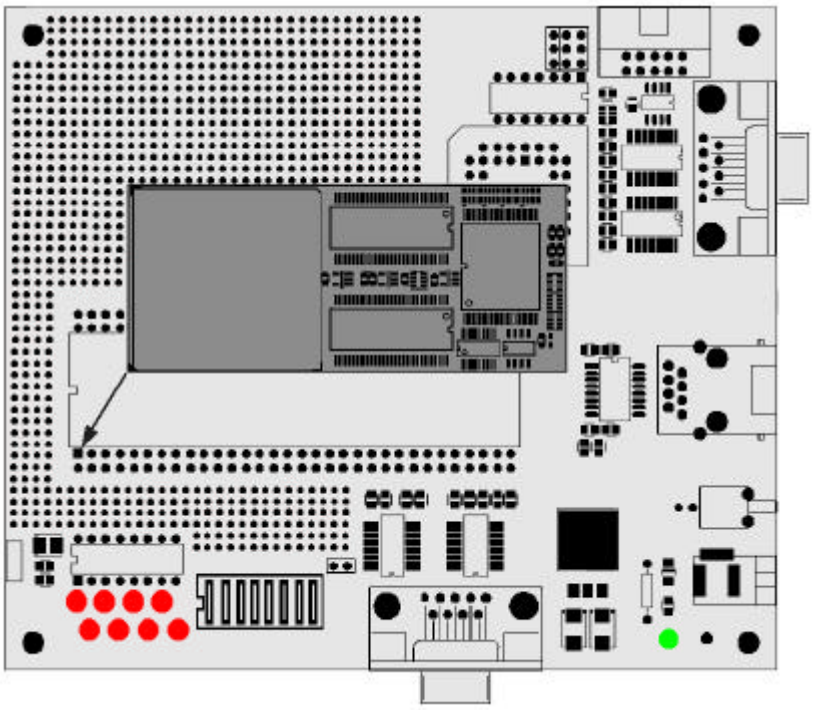


Figure 4-1: Position of the ADNP/1520 on the Evaluation Board

4.2 Cable Connections

Before you can use your DIL/NetPC Starter Kit you need a further Desktop- or Notebook-PC, which acts as development system. This development system should run under MS-Windows or Linux in an ideal manner. Between the development system and the Starter Kit are two connections required. At first the **RS232 Serial Link** and at second the **Ethernet Link**. The PC will act as development system and as **Remote Console Monitor (RCM)** for the ADNP/1520 on the Evaluation Board.

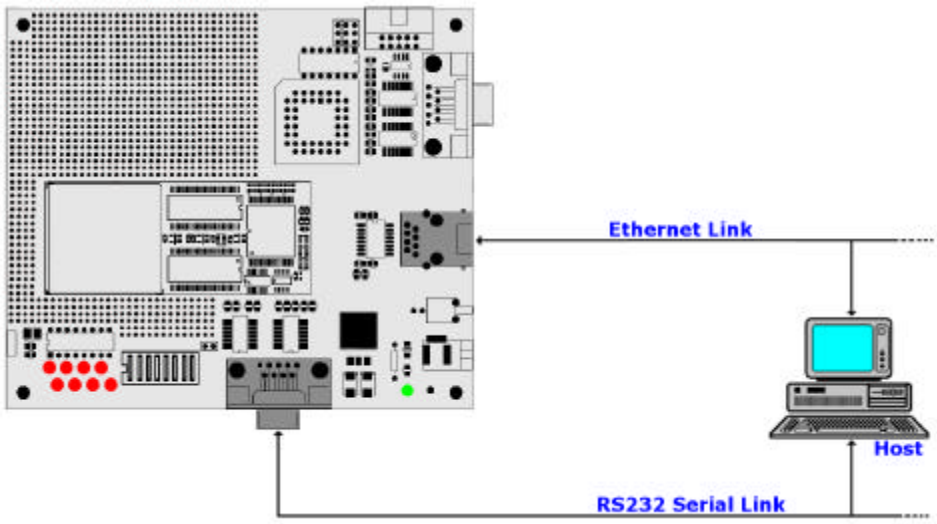


Figure 4-2: Overview about the required cable Connections

4.3 Serial Link

For the Serial Link, you need a Null-Modem cable. This cable comes along with your Starter Kit. Please connect the Evaluation Board with the COM1 port of your development system by using this cable.

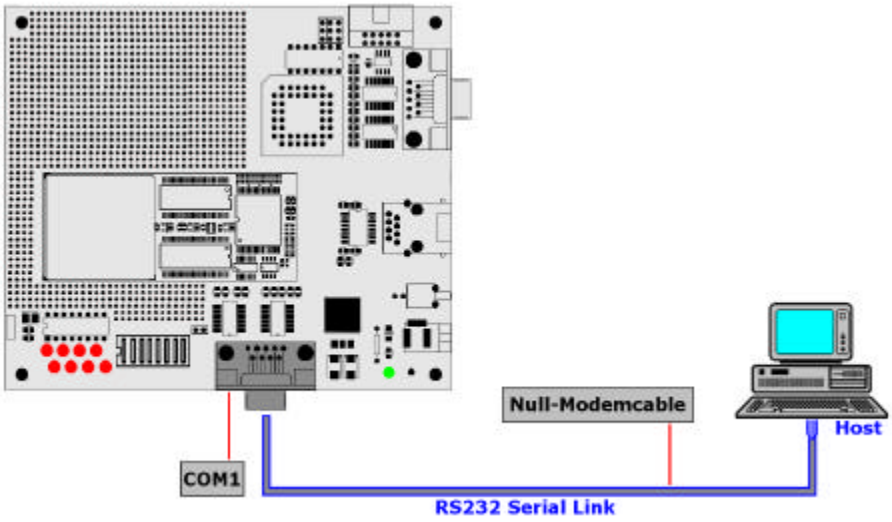


Figure 4-3: Serial Link Connection

4.4 Ethernet Link

The Ethernet Link can be made on two ways. First, with a crossover cable and second, with two standard 10Base-T patch cables and a Hub or Switch. In both cases an Ethernet-LAN interface for your development system is required. If you use a Hub or Switch please connect them between your development system and the ADNP/1520 like shown in the figure below.

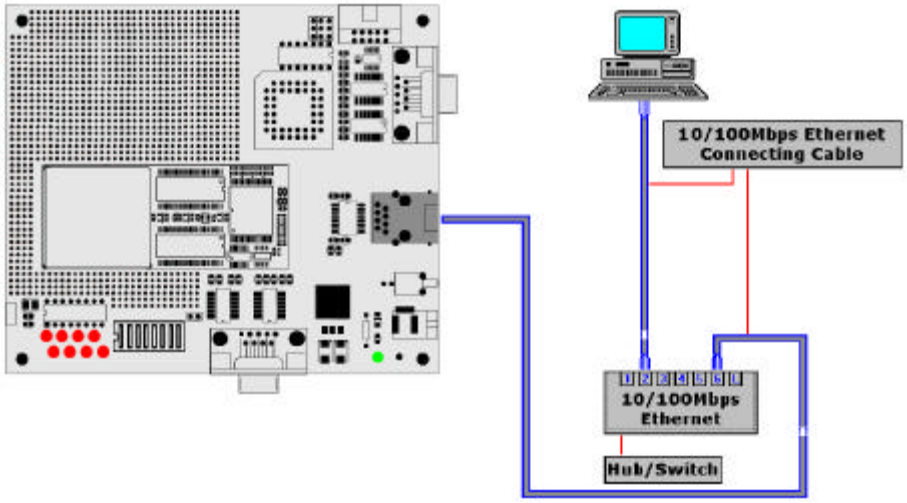


Figure 4-4: Ethernet Link Connection using a Hub/Switch

If you want to connect your development system directly to the ADNP/1520, place a crossover cable between this two components like shown in the next figure.

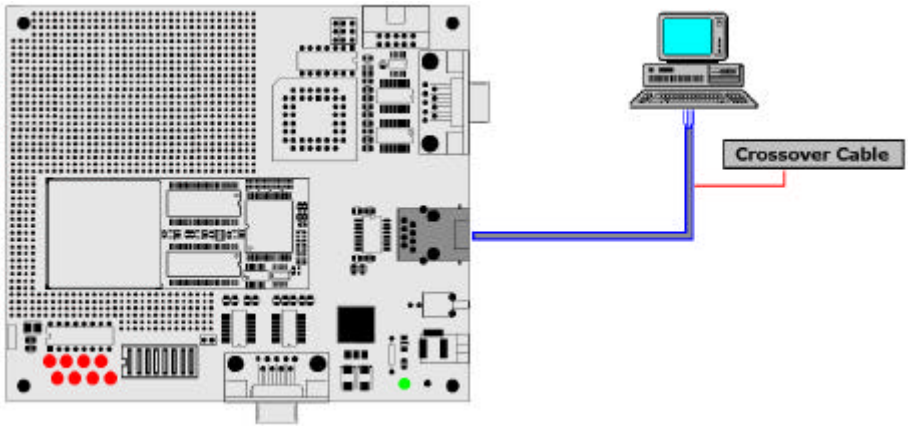


Figure 4-5: Ethernet Link Connection using a crossover cable

4.5 Power Supply

The ADNP/1520 Starter Kit needs a supply voltage of 5VDC to work. In your Starter Kit package you will find a plug-in power supply unit to provide the system with the necessary power. After the connection of all cables the Starter Kit is ready to run.

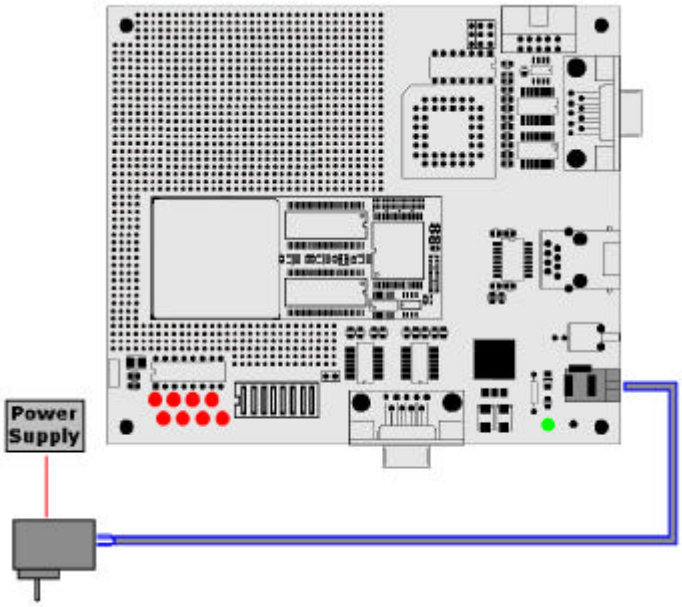


Figure 4-6: Power supply Connection

Caution: Providing the Evaluation Board with a voltage higher than the regular 5V DC $\pm$ 10% could resolve in damaged board components.

5 First Steps

You can use the ADNP/1520 Starter Kit from your development system. This development system may run under different operating systems. The first steps for getting started we describe exemplary by the two most popular operating systems – MS-Windows and Linux.

5.1 Using a Windows–based development System

The following paragraphs will help you to use the ADNP/1520 with a development system running under MS-Windows. For these steps some programs are necessary, which normally come along with every MS-Windows installation (e.g. HyperTerminal). Please make sure that these programs are present on your development system. If these programs are not installed at your development system – you have to install these programs manually from your MS-Windows installation CD-ROM.

5.1.1 Setup the Serial Link

Before you provide the Evaluation Board with power for the first time, please run a terminal program – for example Windows HyperTerminal – that offers communication capabilities on your development system. In the following you will see the necessary settings for HyperTerminal under Windows. Select the "direct link cable connection via COM1" interface in the property sheet and choose "Configure".

Figure 5-1: Interface property Sheet

Now you can change some configuration parameters – such as the maximum baud rate – on a further property sheet. Select the value "115.200" in the "Bits per Second" field and close the property sheet by clicking the "OK" button, as shown in figure 10.

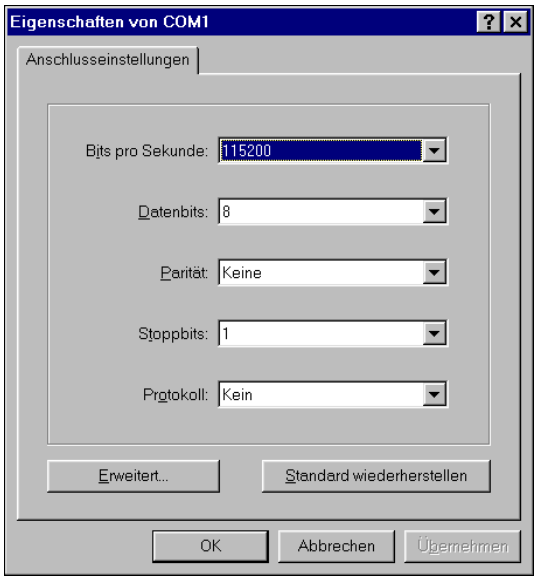


Figure 5-2: Baud rate Settings

All these settings can also be used for other terminal programs. The following parameters are important to use:

- Connection Speed 115.200 bps (Bits per Second)
- 8 Data bits
- No Parity bit
- 1 Stop bit
- No Protocol (Xon/Xoff, RTS/CTS or similar).

Now turn on the power for the Evaluation Board and you will see all steps of the ADNP/1520 boot process in the terminal program window at your PC.

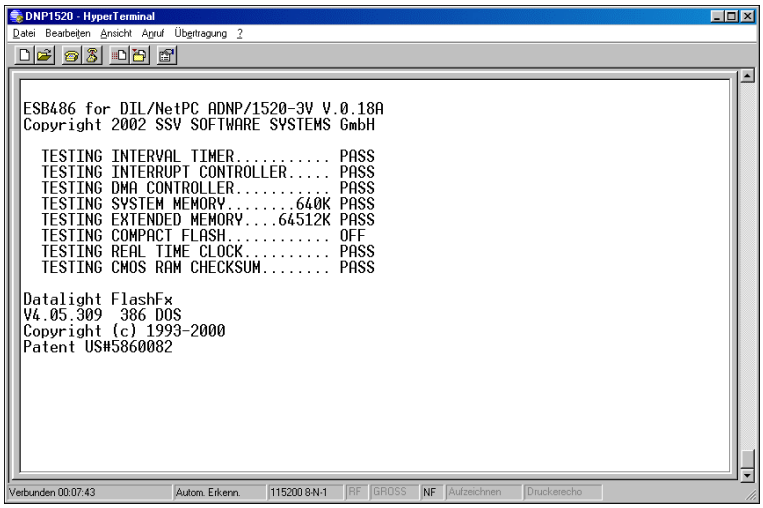


Figure 5-3: ROM-DOS boot process

After the self test sequence is done the ROM-DOS boot process will be initialized. When finished, you will see the following screen with a ROM-DOS prompt which is waiting for a user input.

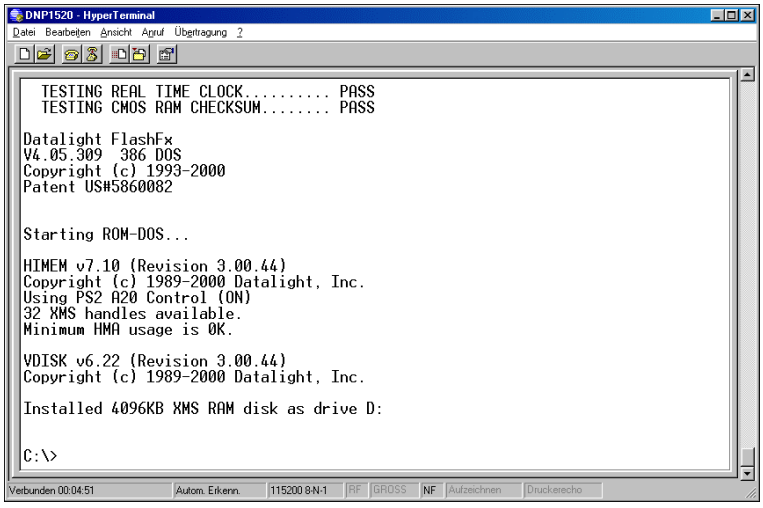


Figure 5-4: ROM-DOS command prompt

Now please enter ***cd emnet*** to change into the directory EMNET. Then type in start to run the Web server inside the ADNP/1520.

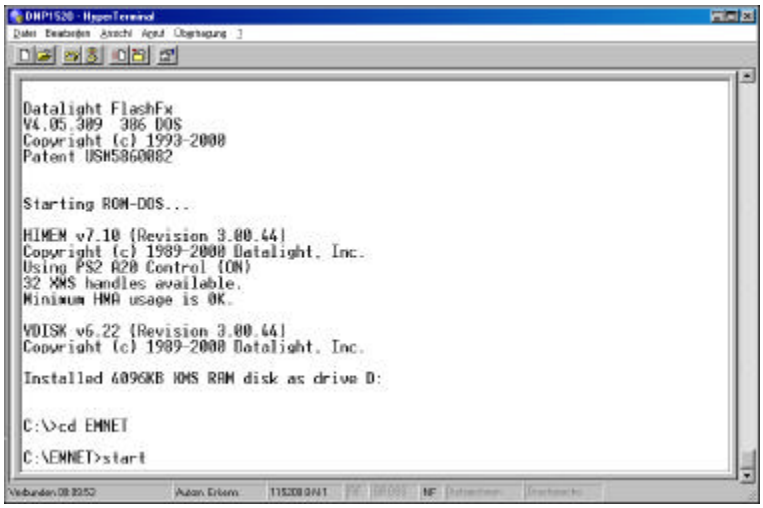


Figure 5-5: Starting the Web server

Note: For a first test of the ADNP/1520 you have to change the assigned IP-address of your development system to ***192.168.0.1***.
To change the IP-address under MS-Windows just click "Start→Settings→Control Panel→Network→TCP/IP" and enter the new IP-address. Please make sure, that you don't use another IP-address – this will lead to different network problems.

5.1.2 Checking the Ethernet Link

To test the TCP/IP-communication we use PING a very popular TCP/IP-utility program. Please open a DOS window (you can find it in the Windows Start menu) and enter:

ping 192.168.0.125

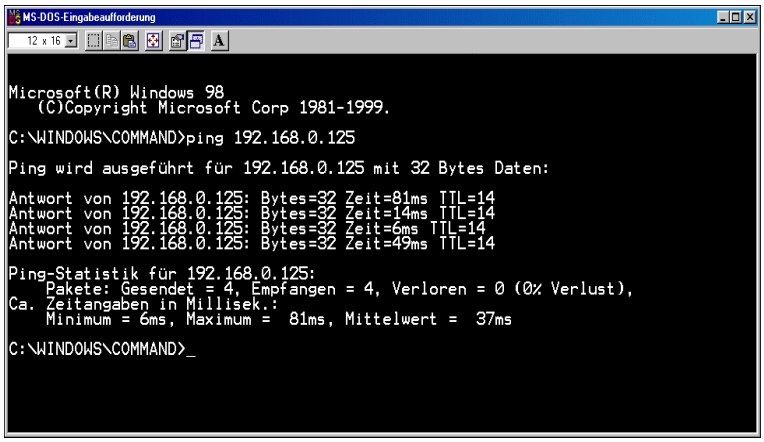


Figure 5-6: Communication check via PING

The Starter Kit must answer this ping. Otherwise an error will occur. In this case you have to check all parts of your LAN-connection, including the IP-address of the development system. Then you should find out if the IP-address is set correctly to the value "192.168.0.1". For an easy check of the IP-address, you can use the following DOS-command:

ipconfig

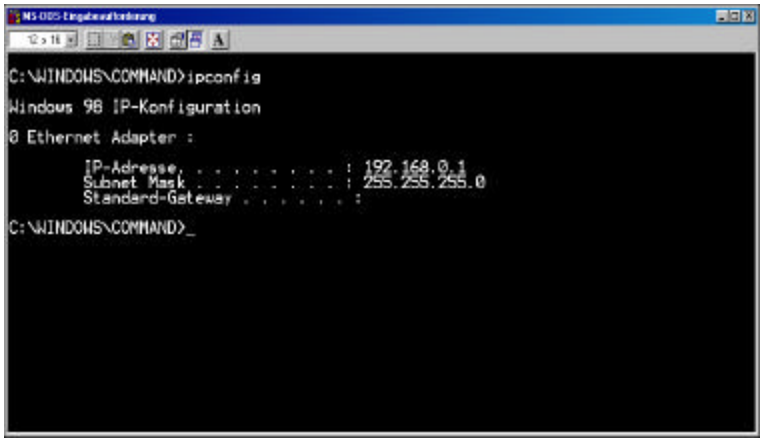


Figure 5-7: Communication check via ipconfig command

Once the ping was successful, you are ready to start a Web browser on your development PC. This browser may be the Microsoft Internet Explorer or another suitable Web browser like the Netscape Communicator or Opera or similar.

5.1.3 Web Server Access

Start a Web browser like the Microsoft Internet Explorer or similar and open the URL ***http://192.168.0.125/index.htm***. The Embedded Web Server will deliver you a small description about ADNP/1520. That's it. Now you are online with the Starter Kit and your Web browser is connected to the Embedded Web Server of the ADNP/1520. It shows you a static web page with some pictures.

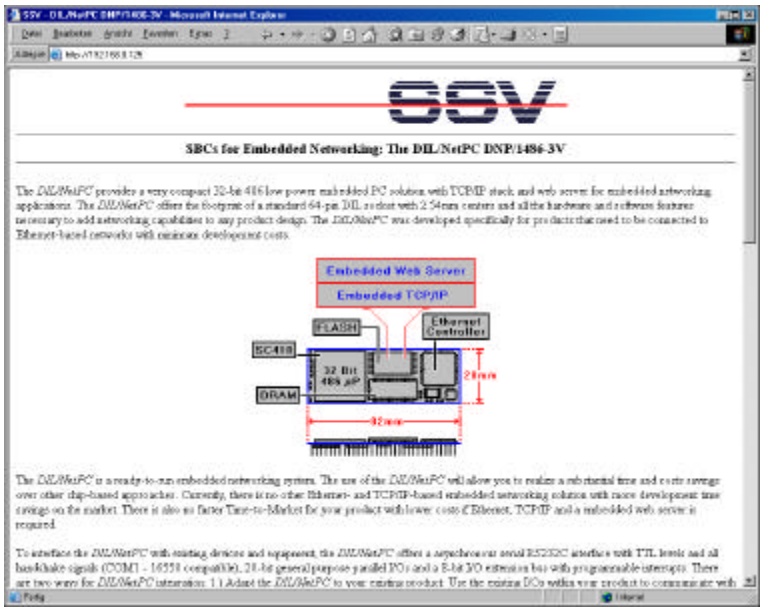


Figure 5-8: Web page shown by the MS-Internet Explorer

If your Web browser can't establish a connection to the Web Server – but the Ping was successful – you should check your browser settings. Please ensure, that your browser is joined with TCP/IP by using the Ethernet card in your development system. Alternatively you have to install a suitable Web browser.

In some cases the Web browser is only configured for modem based Internet access. In this case, please install a second Web browser from your original operating system CD-ROM.

5.1.4 Installing Linux

Now you have to transfer some files from your Starterkit-CD-ROM to the ADNP/1520. At first please restart the ADNP/1520 by pressing the reset button to switch into the default configuration. Then open a HyperTerminal session and type in ***mkdir linux*** to create a directory called LINUX. Type in ***cd linux*** to switch into this new directory. Now please type in the command ***rb*** and confirm this input with pressing ***Enter***. The system turns into a wait state and shows this with sending the letter C to the screen.

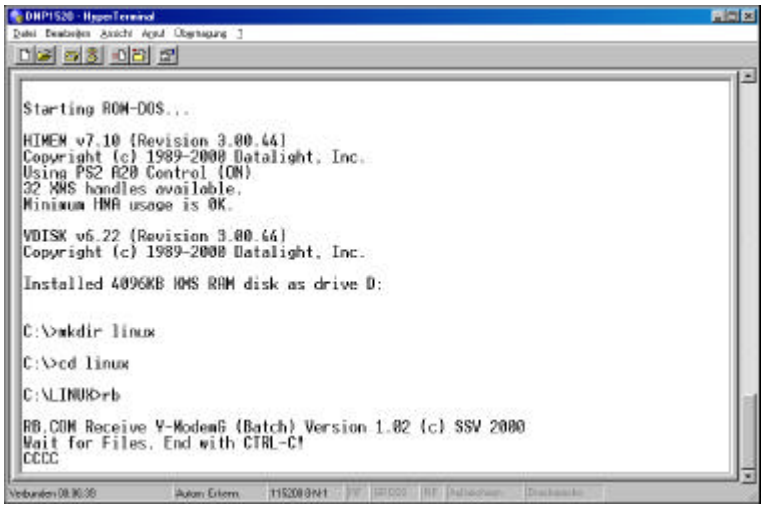


Figure 5-9: Transfering data to the ADNP/1520

At next select the "Transfer→Send File" item in your HyperTerminal control bar.

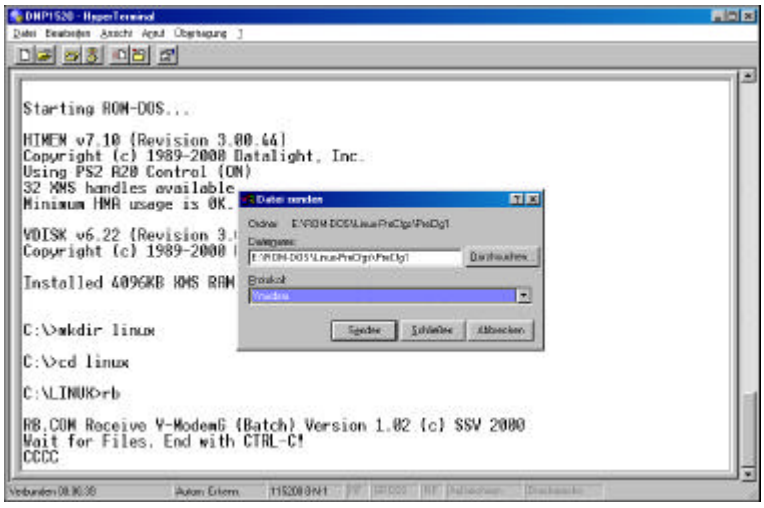


Figure 5-10: Selecting files and transfer protocol

With the help of the "Browse" button you can select the files you need to transfer to the ADNP/1520. In the directory "PreCfg1" you find four files.

LOADLIN.EXE	Bootloader
RIMAGE.GZ	Kernel
START.BAT	Batch File
ZIMAGE	Root Filesystem Image

Please make sure that you have transfered all these files to your ADNP/1520. When all files are transmitted leave this mode by pressing ***Esc*** on your keyboard.

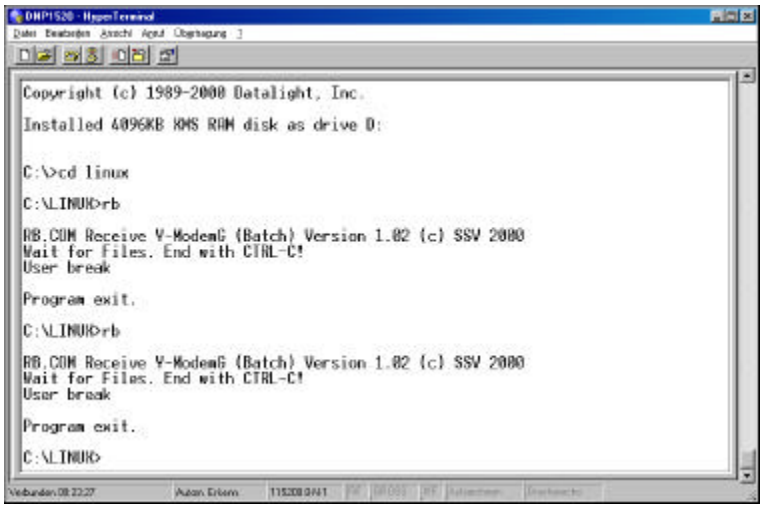


Figure 5-11: Leaving the rb mode

To check out, that all four files are present in the expected directory named LINUX you can type in the command ***dir.*** This shows you the files inside the respective directory.

5.1.5 Running Linux

When all necessary files are placed on the ADNP/1520 you are ready to start Embedded Linux. For this, please type in the command ***start*** and confirm this input with pressing ***Enter***. After some boot messages you will see the following screen.

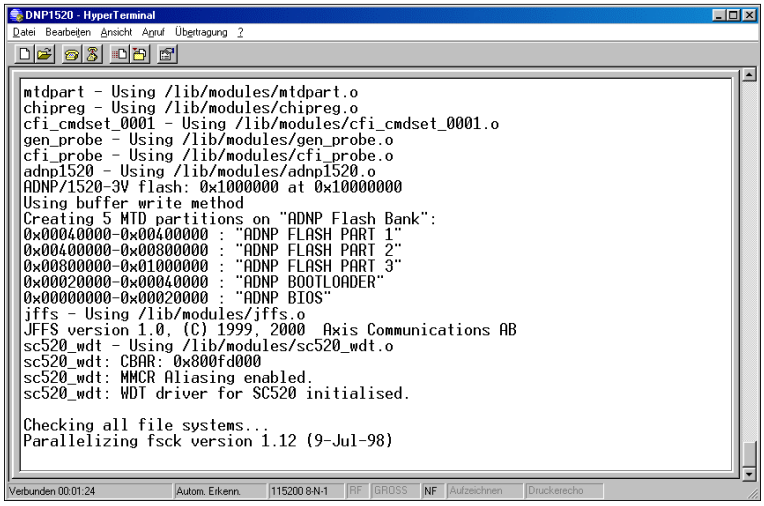


Figure 5-12: Starting Linux

When the Linux boot process is done the system will stop with the following login prompt.

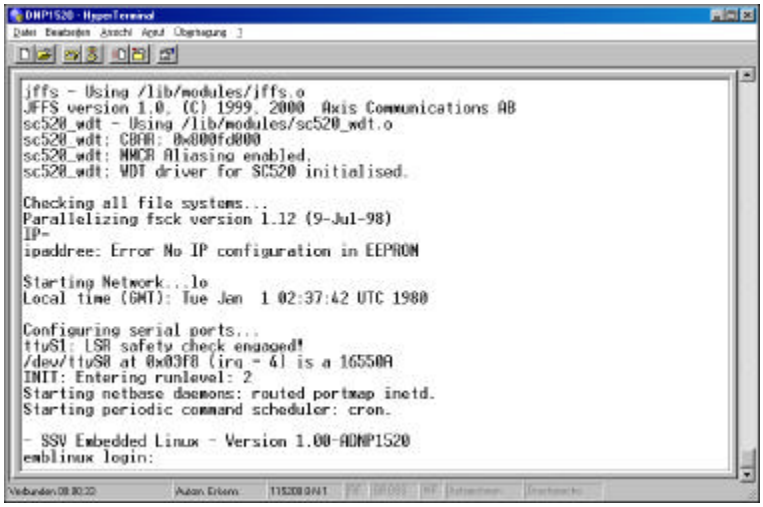


Figure 5-13: Linux login prompt

5.1.6 Login via Serial Console

From a development system running under MS-Windows you can gain access onto the ADNP/1520 via the HyperTerminal program by using the username ***gast***. There is no specific password needed. On the point where the password is expected simply press the ***Enter*** (Return) key. After a successful login type in the command ***ps -A***. Your system is now ready to execute arbitrary commands.

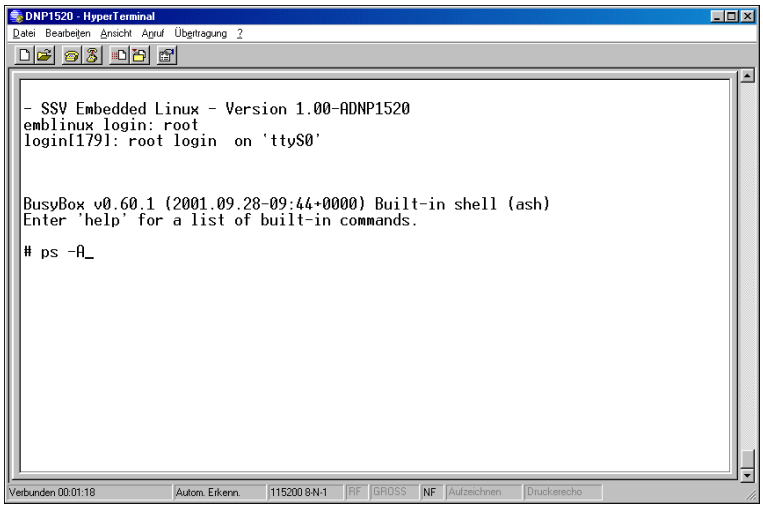


Figure 5-14: Login procedure via HyperTerminal

5.1.7 Login via Telnet

You are now able to start a Telnet client on the development system. Open a command shell and enter the following command:

telnet 192.168.0.126

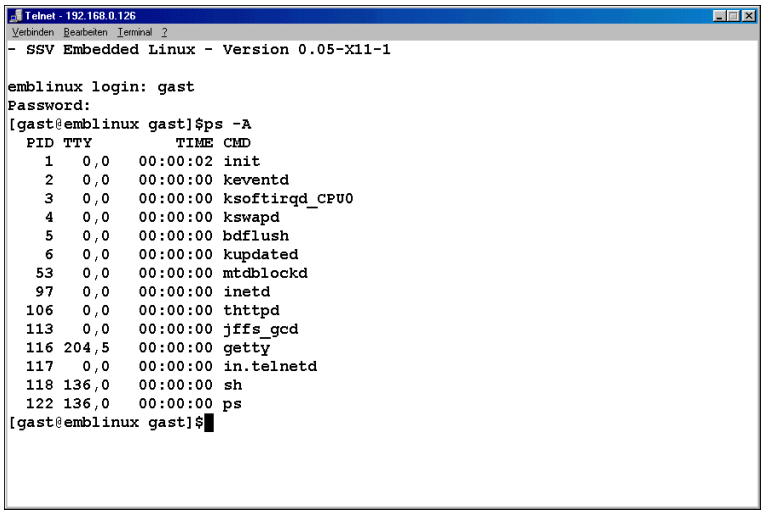


Figure 5-15: Login procedure via Telnet

Please pay attention, this command will pass the IP-address of your ADNP/1520 as parameter to the client.

5.1.8 File Transfer via FTP

The **File Transfer Protocol (FTP)** provides a common approach to transfer files between clients and servers. FTP is a client/server protocol like Telnet. The FTP client/server capability is build into most Windows versions. An FTP session begins when the client builds a TCP/IP connection to the server. Once this connection is established, the client will log on to this server. In our actual case your development system acts as client and the ADNP/1520 operates as server. After the successful access onto the server you are able to execute various file transfer commands, which typically concern the navigation through the FTP server's directory structure and send or receive files. In the following an example of an FTP session is shown.

To use the File Transfer Protocol on your system, please open a DOS window (via the Windows Start menu) and branch into the desired subdirectory. Now enter ***FTP 192.168.0.126*** and open an FTP connection between client and server. The system will now ask you for a username. To answer this request please enter ***gast*** and confirm the expected password with simply pressing the ***Enter***-key. At this point there is no specific password required. On figure 16 you see the described user inputs in form of highlighted text.

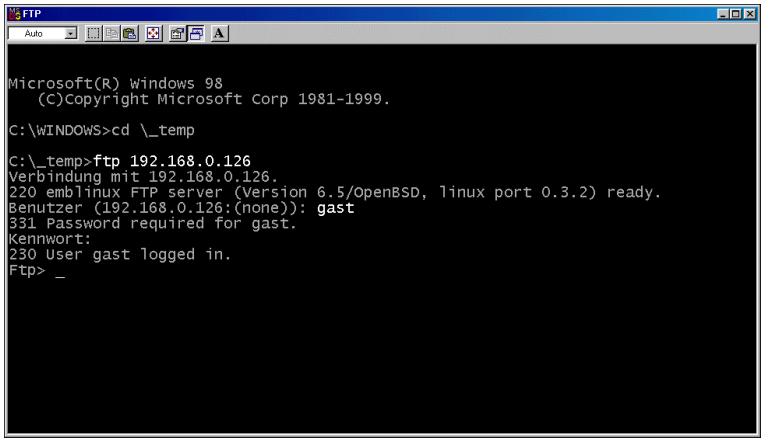


Figure 5-16: Login procedure via FTP

Now you are ready to transfer a file from your Windows-based development system to the ADNP/1520. Before you can transfer a file via FTP you should check, that the FTP link is set correctly to the binary operation mode via the ***binary*** command. In some cases the default setting is ASCII. With the ***pwd*** command you can check out the name of the remote directory. Please note, that the Read/Write access is only allowed for the directory ***\home\gast***. To transfer a file from your development system to the ADNP/1520 use the command:

put filename

For a first view on the content of a directory you should use ***ls –al***. This command shows you the files stored inside a specific directory. To terminate an FTP session use the command ***bye***. This will cancel every operation between client and server. The figure below shows you these operations.

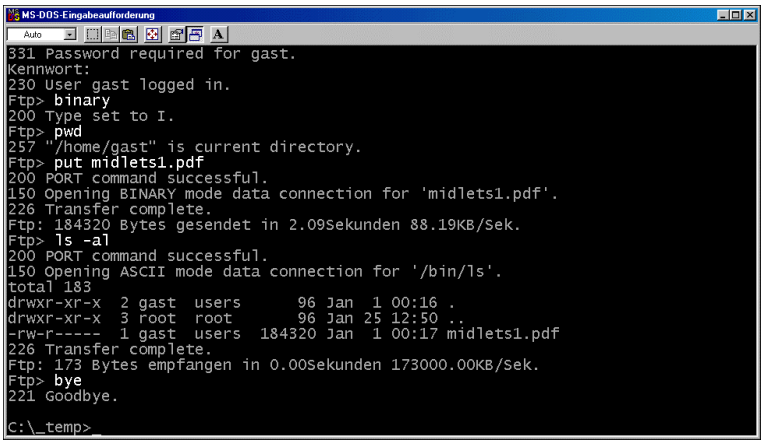


Figure 5-17: FTP file transfer under DOS

In some Windows versions the Internet Explorer is able to act as FTP client just like an Internet browser. To transfer files by using the Internet Explorer enter ***ftp://gast@192.168.0.126*** as URL into the address bar. Moreover open the Windows Explorer as second file destination. Now you can transfer your desired files very easy by using drag and drop between these two windows. Simply drag the selected file(s) from the Windows Explorer into the Internet Explorer window and drop it down into the chosen directory.

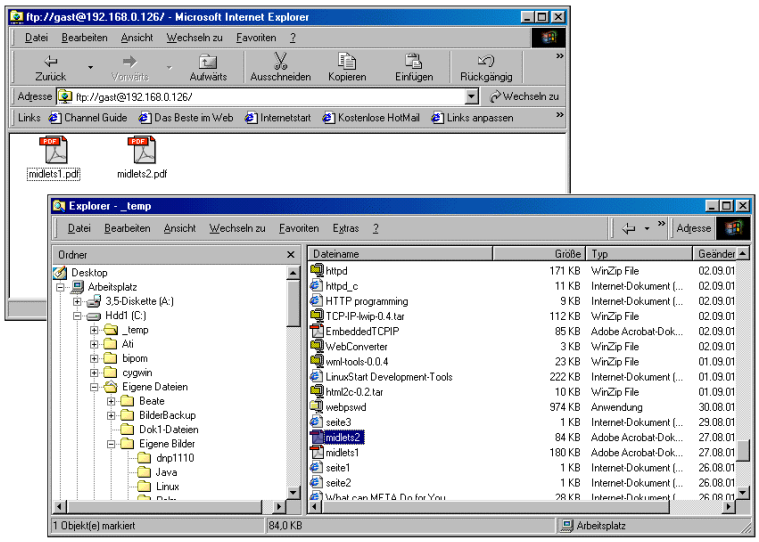


Figure 5-18: File transfer with the Internet Explorer

5.2 Using a Linux–based development System

The following paragraphs will help you to use the ADNP/1520 with a development system running under Linux. For this steps are some programs necessary, which normally come along with the Linux installation (i.e. Minicom). Please make sure that these programs are present on your development system. If necessary you have to install these programs from your Linux installation CD-ROM.

5.2.1 Setup the Serial Link

Before you provide the Evaluation Board with power for the first time, please run a terminal program like **Minicom**. Minicom is a simple serial communication program originally written by Miquel van Smoorenburg. It offers basic communication capabilities and integrates well with the Linux user interface. Minicom is a lot like the old MS-DOS program PROCOMM. This program can be used to connect a Linux-based PC to embedded devices such as the ADNP/1520 for initial configurations. In the following we will show you how to use Minicom and what you have to do to adjust the necessary settings.

Open a terminal window and type in the command ***minicom -s*** to get access to the serial port settings. Now you can change some configuration parameters – such as the maximum baud rate. Set the serial port parameters for the maximum baud rate on "115.200 bps".

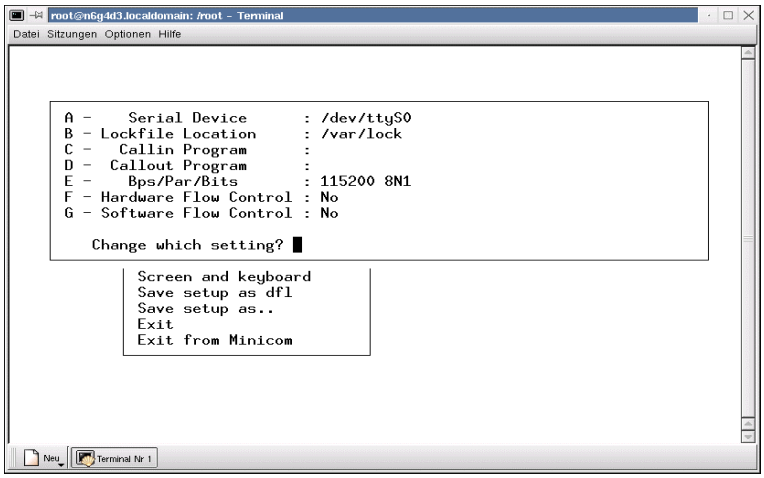


Figure 5-19: Serial Port Settings under Minicom

After that, please turn on the power for the Evaluation Board. You will now see all steps of the ADNP/1520 ROM-DOS boot process via Minicom.

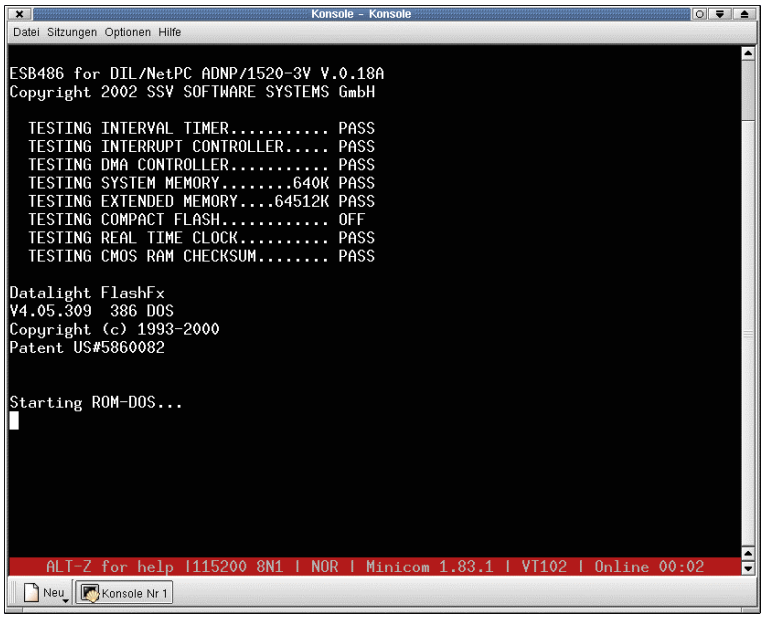


Figure 5-20: ROM-DOS boot process in progress

To the end of this sequence a ROM-DOS command prompt will appear. The boot process of the ADNP/1520 is now complete.

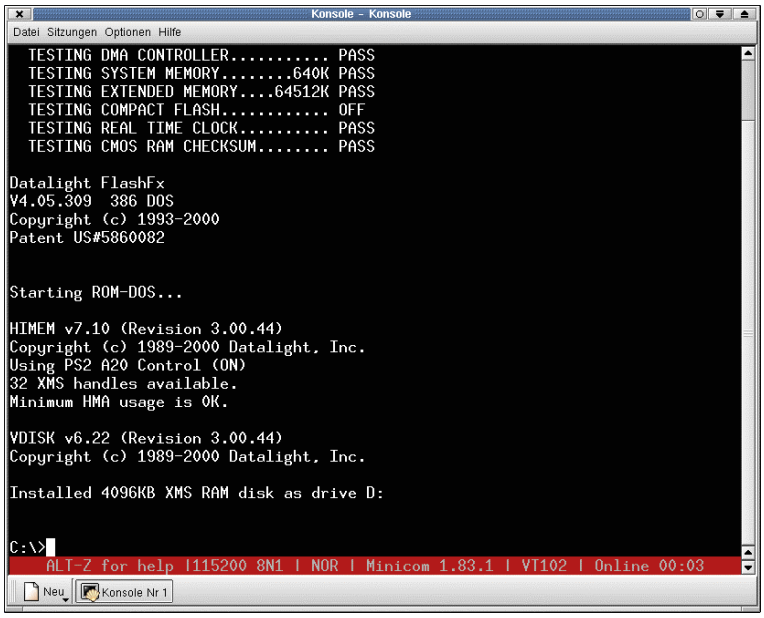


Figure 5-21: After the ROM-DOS boot process

Now please enter ***cd emnet*** to change into the directory EMNET. Then type in ***start*** to run the Web server inside the ADNP/1520.

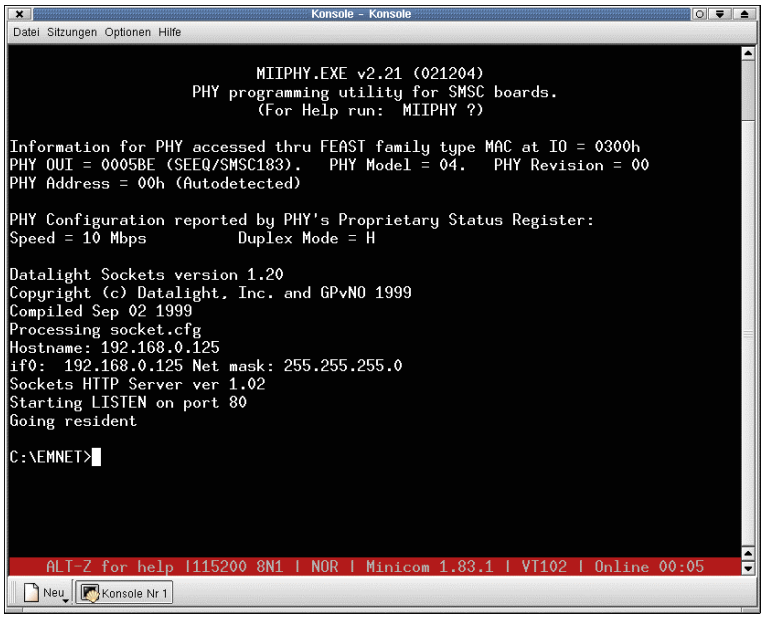


Figure 5-22: Running the DOS-based Web server

Note: For a first test of the ADNP/1520 you have to change the assigned IP-address of your development system to ***192.168.0.1***. Please make sure, that you don't use another IP-address – this could lead to different network problems.

5.2.2 Checking the Ethernet Link

Please open a shell window and type in ***ping 192.168.0.126***. Every ping request has to be answered by your ADNP/1520 similar as shown below.

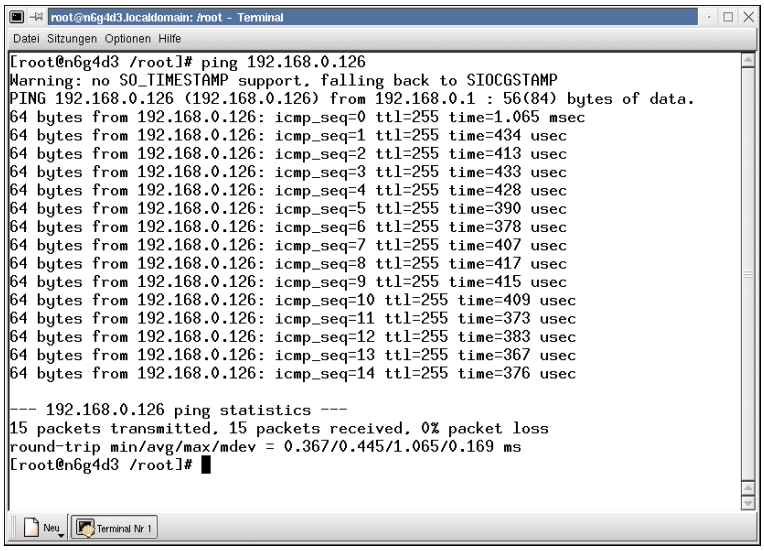


Figure 5-23: Ping Request

To cancel the ping request just press the keyboard shortcut ***Ctrl+C***. If an error occurs (e.g. the ADNP/1520 don't answer the ping of your development system) you have to check your cable connections at first.

Then you should check if the IP-address is set correctly to "192.168.0.1". For an easy check of the IP-address, you can use the Linux-command ***ifconfig***.

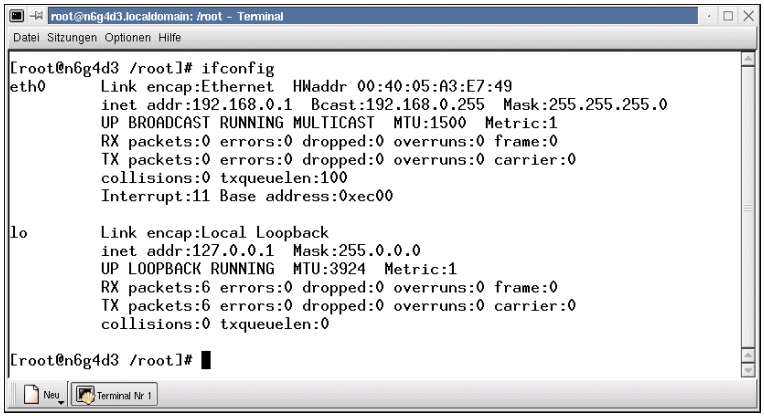


Figure 5-24: IP-address check via ifconfig

5.2.3 Web Server Access

Once the ping was successful, you are ready to start a Web browser on your development system. This may be the Konqueror File Manager or the Netscape Communicator/Navigator. The Konqueror File Manager is normally part of the Linux installation and acts as File Manager as well as Web browser. Konqueror is able to detect automatically when an URL were entered and shows the content.

Just enter the URL ***http://192.168.0.126/index.htm*** and press the ***Enter***-key. The Embedded Web Server will deliver you a small description about the ADNP/1520.

That's it. You are now online with the Starter Kit. The Web browser of your development system is connected to the Embedded Web Server of the ADNP/1520 and shows you a static web page with some pictures.

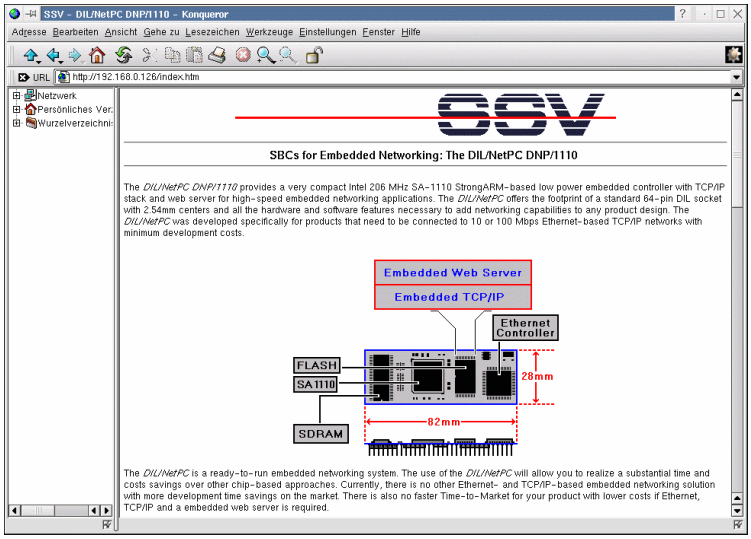


Figure 5-25: Web page shown by the Konqueror File Manager

5.2.4 Installing Linux

To use your ADNP/1520 with Linux you have to transfer some files from your Starterkit-CD-ROM to the ADNP/1520. At first, please restart the ADNP/1520 by pressing the reset button. This make sure, that the system is into the default configuration. Then open a Minicom session and type in ***mkdir linux*** to create a directory called LINUX. Type in ***cd linux*** to switch into this new directory. Now please type in the command ***rb*** and confirm this input with pressing ***Enter***. The system turns into a wait state and shows this with sending the letter C to the screen.

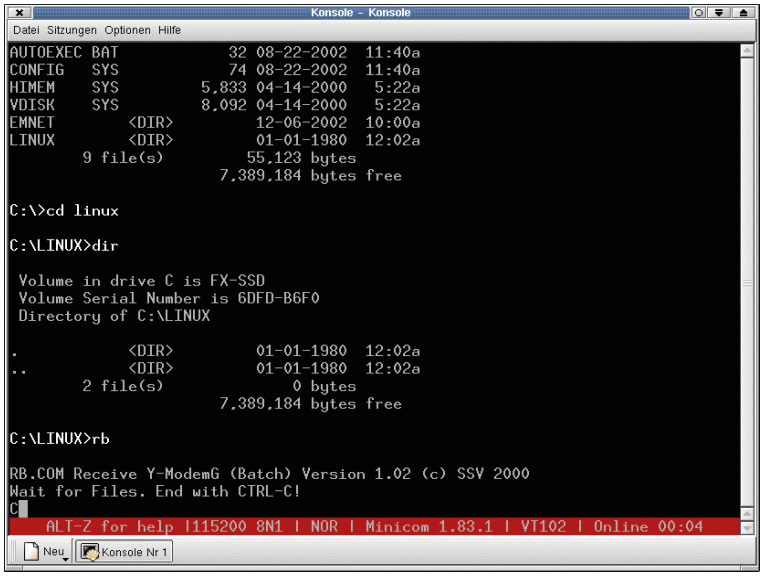


Figure 5-26: Installing Linux from the Starter Kit CD-ROM

At next select the "zmodem" option in the upcoming Minicom window and confirm this with pressing ***Enter***. The reason to do this although you normally would choose "ymodem" is a little bug in Minicom, so here you have to select ***zmodem*** absolutely. Choosing "ymodem" may result in different error messages.

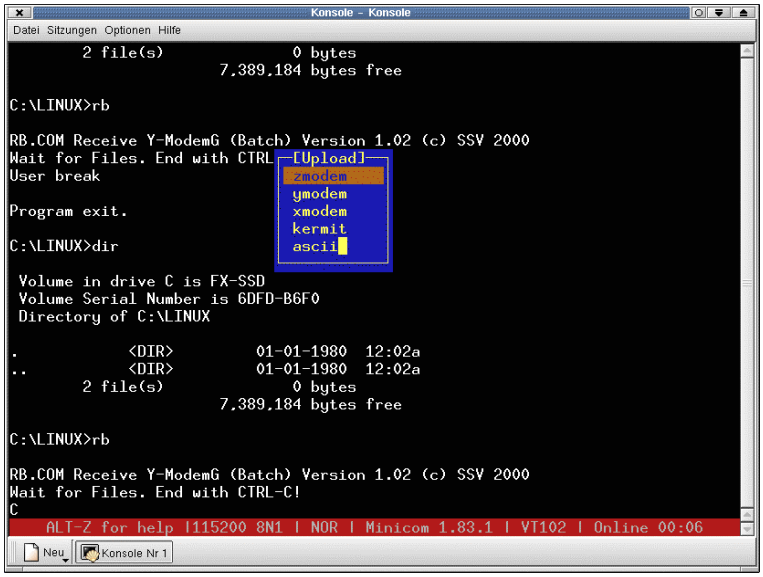


Figure 5-27: Selecting transfer protocol

Then select the files you need to transfer to the ADNP/1520. In the directory ***\cdrom\ROM-DOS\Linux-PreCfgs\PreCfg1*** you find the four files.

LOADLIN.EXE	Bootloader
RIMAGE.GZ	Kernel
START.BAT	Batch File
ZIMAGE	Root Filesystem Image

Please select and transfer all these files to your ADNP/1520. When all files are transmitted leave this mode by pressing ***Esc*** on your keyboard.

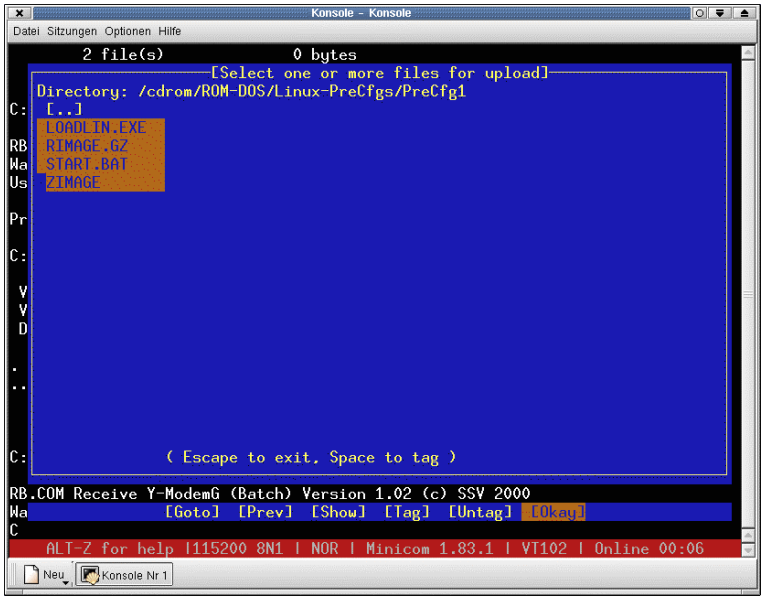


Figure 5-28: File select in rb mode

The following figure shows the file transfer process from the Starter Kit CD-ROM to the ADNP/1520.

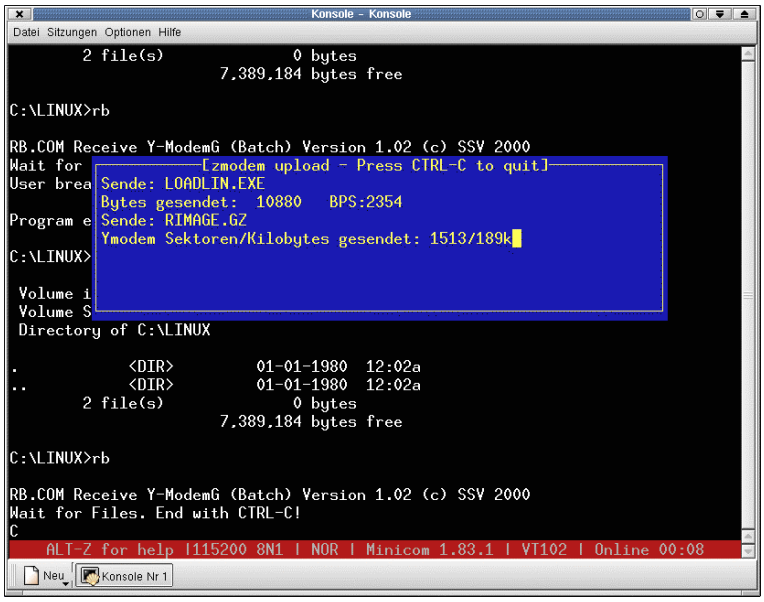


Figure 5-29: File transfer in rb mode

5.2.5 Running Linux

When all necessary files are placed on the ADNP/1520 you are ready to start Embedded Linux. For this, make sure, that you are within the directory C:\LINUX. Type in the command ***start*** and confirm this input with pressing ***Enter***. After some boot messages you will see the following screen.

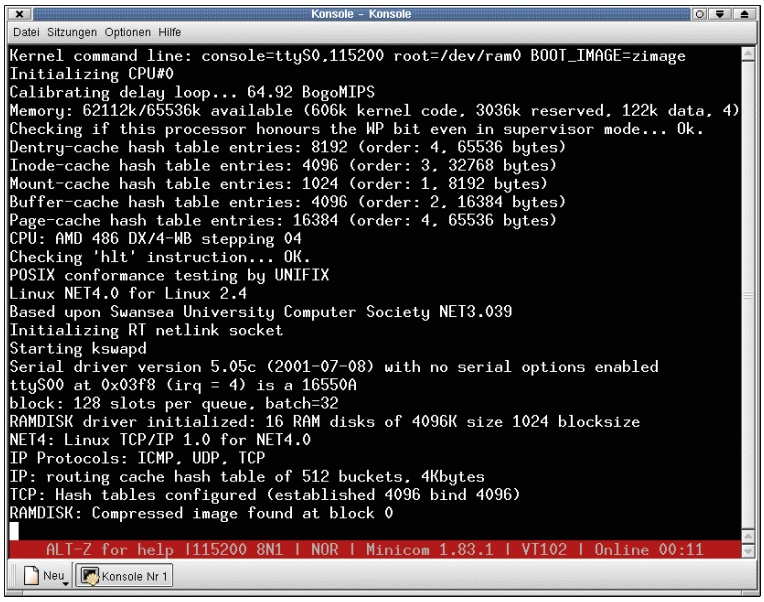


Figure 5-30: Running Linux

When the Linux boot process is done the system will stop with the following login prompt.

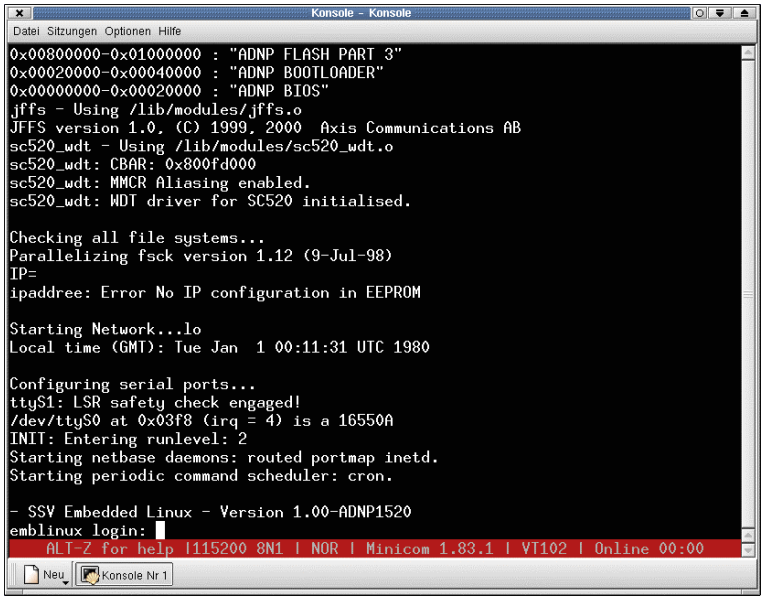


Figure 5-31: Linux login

5.2.6 Login via Serial Console

Under Linux you can gain access onto the ADNP/1520 via Minicom by using the username ***gast***. A specific password is not necessary. At this point simply press the ***Enter*** (Return) key. Your system is now ready to execute arbitrary Linux commands.

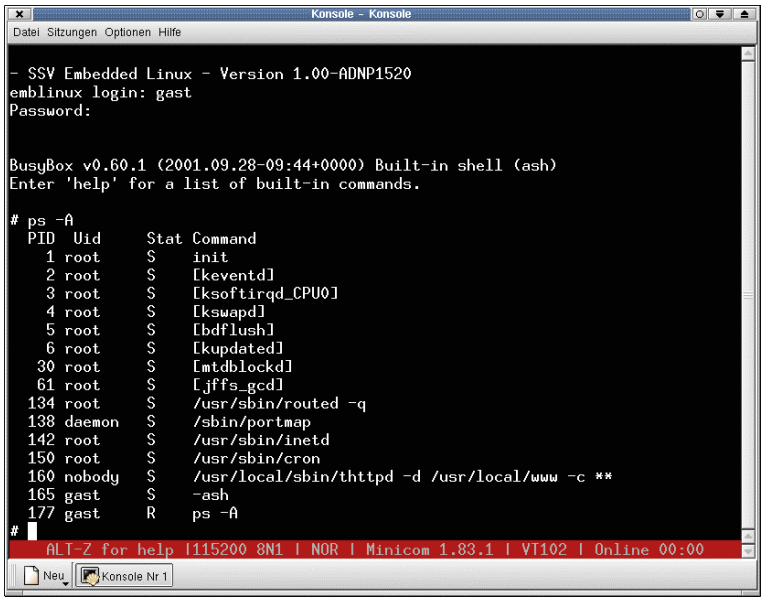


Figure 5-32: Login procedure via Minicom

5.2.7 Login via Telnet

You are now able to start a telnet client on the development system. Open a Minicom command shell and enter the following command:

telnet 192.168.0.126

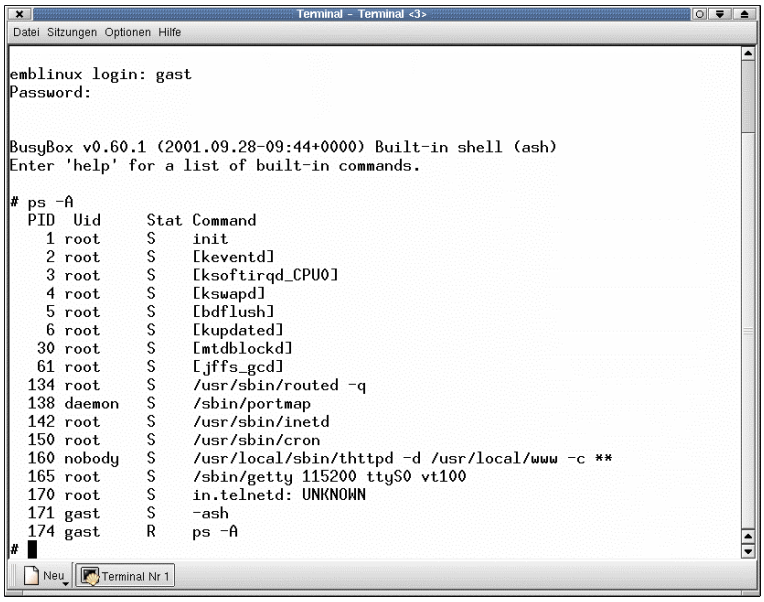


Figure 5-33: Login procedure via Telnet

Please pay attention, that this command will pass the IP-address of your ADNP/1520 as parameter to the client.

5.2.8 File Transfer via FTP

The **File Transfer Protocol** (FTP) provides a common approach to transfer files between clients and servers. FTP is a client/server protocol like Telnet. An FTP session begins when the client builds a TCP/IP connection to the server. Once this connection is established, the client will log on to this server. In our actual case your development system acts as client and the ADNP/1520 operates as server. After the successful access onto the server you are able to execute various file transfer commands, which typically involves navigating the FTP server's directory structure and send or receive files. In the following an example of an FTP Session is shown. The FTP client/server capability is already build into the Konqueror.

To use the File Transfer Protocol on your Linux system please open a command shell, like Minicom and branch into the desired subdirectory. Now enter ***FTP 192.168.0.126*** and open an FTP connection between client and server. The system will now ask you for a username. To answer this request please enter ***gast*** and confirm the expected password with pressing ***Enter***. At this point there is no specific password required. On figure 31 you see the user inputs as highlighted text.

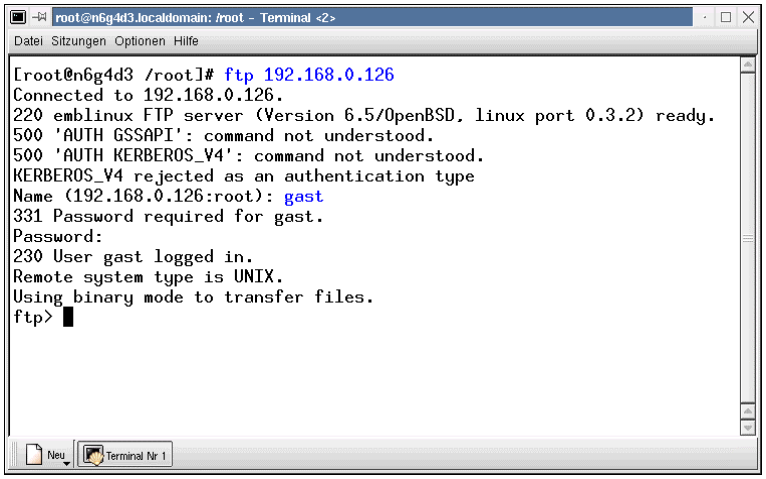


Figure 5-34: Login procedure via FTP

Now you are ready to transfer a file from a Linux-based development system to the ADNP/1520. Before you can transfer a file with FTP you should check, that the FTP link mode is correctly set to the binary operation mode via the ***binary*** command. In some cases the default setting is ASCII. With the command ***pwd*** you can check out the name of the remote directory. The Read/Write access is only allowed for the directory ***\home\gast***. To transfer a file from your development system to the ADNP/1520 use ***put filename*** to transfer the desired file.

For a first view on the content of a directory you should use ***ls –al***. This command shows you the files stored inside a specific directory. To terminate an FTP session use the command ***bye***.

This command cancels every operation between server and client. Figure 32 shows you these operations.

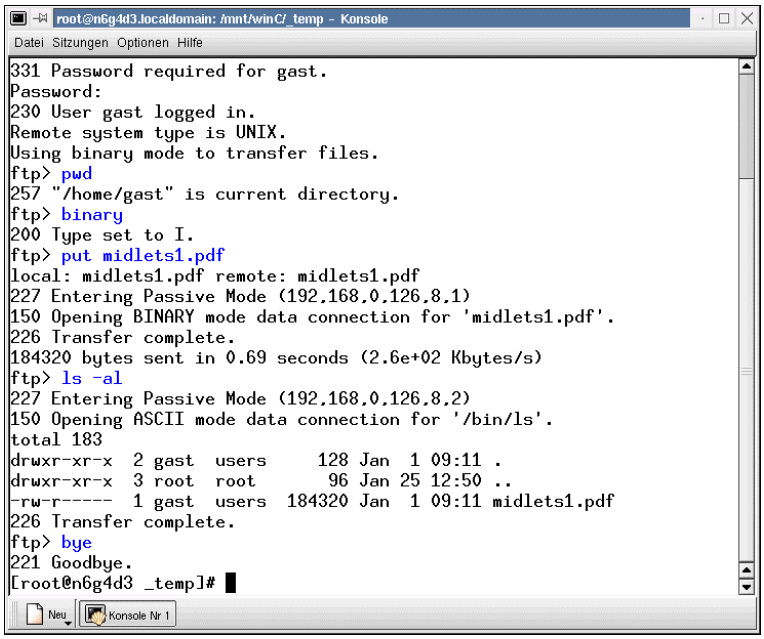


Figure 5-35: File transfer with Minicom

Next to Minicom it is also possible to use the Konqueror File Manager to transfer files by FTP. For this, please open Konqueror and enter ***ftp://gast@192.168.0.126*** as URL into the address bar. The Konqueror knows the difference between your system directories and folders (\\) and an Internet or intranet address (//). So you can simply type in the desired address. Open a second instance of Konqueror and change into the desired source directory. After that, you are able to transfer arbitrary files very easy by using drag and drop between these two Konqueror windows.

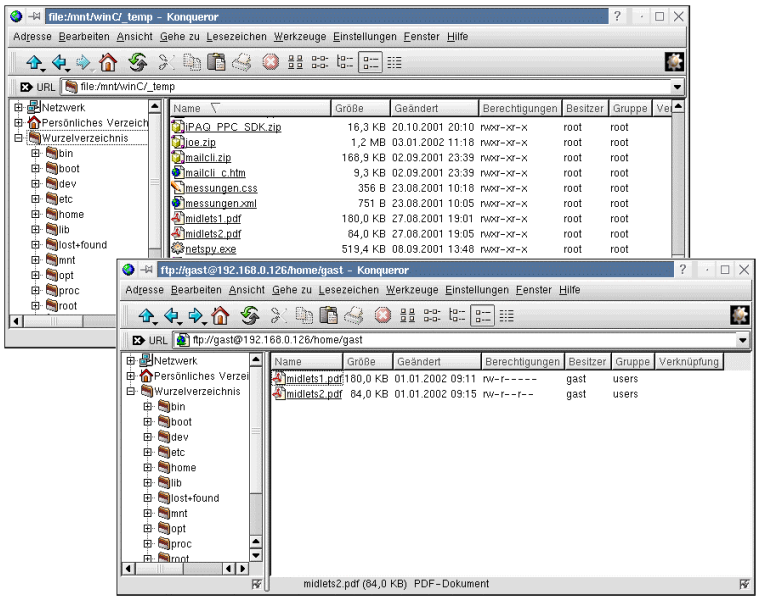


Figure 5-36: File transfer with the Konqueror

6 Setting your own IP-address with Linux

The ADNP/1520 comes with a pre-configured IP-address. This default IP-address of the ADNP/1520 for running under DOS is set to 192.168.0.125. When the ADNP/1520 is running under Linux the IP-address is set to 192.168.0.126

6.1 Setting the IP-address under DOS

The default IP-address for a Windows-based development system running you can find within the file ***Socket.cfg*** wich is located in the directory ***C:\Emnet***. Alternatively this file is stored inside the directory ***E:\ROM-DOS\TCP-IP\Emnet*** on your Starter Kit CD-ROM. The following Listing shows the content of the file Socket.cfg.

```
# INET.STU is the default STartUp file to be executed by
SOCKETP.EXE.

# (You should edit INET.HST to contain all your IP addresses
# linked suitable host names.  See also the SETHOST utility
# that can link IP addresses to MAC/Ether addresses.)
# In the next line, "demo" should be replaced with this
machine's
# host name, decimal IP address or variable containing the
name.
ip address 192.168.0.125

# Iface sets the physical interfaces used. (Packet driver,
serial ports, etc.)
# Interrupt vector of your packet driver is 0x60
iface pdr if0 dix 1500 10 0x60

# When using a gateway (IP router) to the rest of the world,
# replace "XXX.XXX.XXX.XXX" with your gateway ip.
# route add default if0 XXX.XXX.XXX.XXX

# When using a dns to resolve name lookups, replace
"XXX.XXX.XXX.XXX"
# with your gateway ip.
# domain server XXX.XXX.XXX.XXX

# The following line will just display the info for easy
verification:
ip address

# The following lines set TCP/IP parameters:
ip ttl 15
tcp mss 1460
tcp window 2920
```

6.2 Setting the IP-address under Linux

To set the IP-adress of your ADNP/1520 with a development system running under Linux it is necessary to open a serial data connection between the development system and the ADNP/1520. Please use ***root*** as login name and type in ***ipaddree*** to start the respective program.

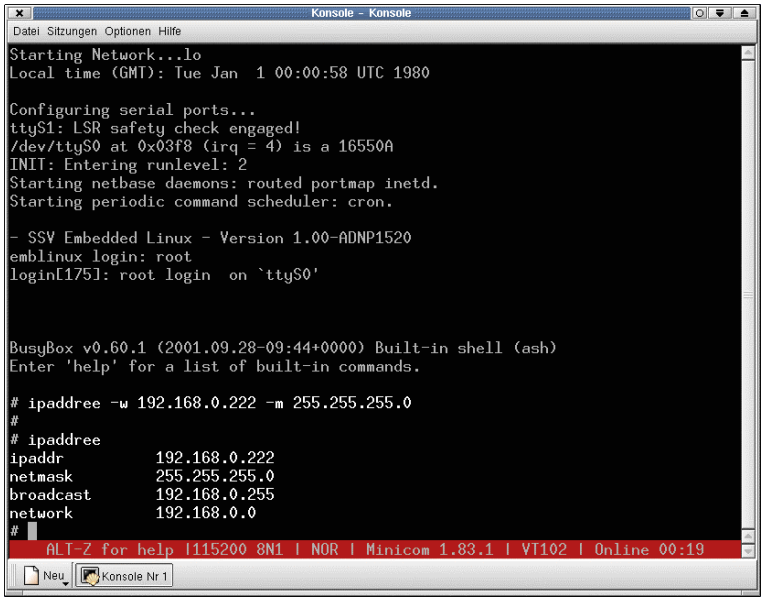


Figure 6-1: Changing the IP-address with ipaddree

With help of ipaddree it is possible to change the IP-address of the ADNP/1520. With enter ***ipaddree -?*** the programm will show you a short help dialog.

Note*:* After you have changed the IP-address it is absolut necessary to restart the ADNP/1520. After the restart the changed settings will be stored durable in the Flash of the ADNP/1520.

7 Troubleshooting

This page shows problems that can be corrected by users. If a problem persists after trying these solutions, please contact SSV Embedded Systems.

Phenomenon	Probable Cause	Reference
No power to the system at all. Power light does not illuminate.	Power cable is unplugged	Make sure power cable is securely plugged in.
	Power supply failure.	Contact technical support.
	Defective power cable.	Contact technical support.
	Incorrect polarity.	Make sure polarity of the cable matched with polarity from connector.
No boot messages.	RCM jumper is not set.	Open RCM jumper will block all boot messages

8 Appendix

The Appendixes 1 to 4 give you more detailed information about the signals on the individual connectors. Table cells marked with NC indicate signals, which may be not connected.

Appendix 1: Pin Assignment –128-pin QIL Connector (1. Part)

Pin	Name	Group	Function
1	PA0	PIO	Parallel I/O, Port A, Bit 0 *
2	PA1	PIO	Parallel I/O, Port A, Bit 1*
3	PA2	PIO	Parallel I/O, Port A, Bit 2*
4	PA3	PIO	Parallel I/O, Port A, Bit 3*
5	PA4	PIO	Parallel I/O, Port A, Bit 4*
6	PA5	PIO	Parallel I/O, Port A, Bit 5*
7	PA6	PIO	Parallel I/O, Port A, Bit 6*
8	PA7	PIO	Parallel I/O, Port A, Bit 7*
9	PB0	PIO	Parallel I/O, Port B, Bit 0*
10	PB1	PIO	Parallel I/O, Port B, Bit 1*
11	PB2	PIO	Parallel I/O, Port B, Bit 2*
12	PB3	PIO	Parallel I/O, Port B, Bit 3*
13	PB4	PIO	Parallel I/O, Port B, Bit 4*
14	PB5	PIO	Parallel I/O, Port B, Bit 5*
15	PB6	PIO	Parallel I/O, Port B, Bit 6*
16	PB7	PIO	Parallel I/O, Port B, Bit 7*
17	PC0	PIO	Parallel I/O, Port C, Bit 0*
18	PC1	PIO	Parallel I/O, Port C, Bit 1*
19	PC2	PIO	Parallel I/O, Port C, Bit 2*
20	PC3	PIO	Parallel I/O, Port C, Bit 3*
21	RXD1	SIO	COM1 Serial Port, RXD Pin
22	TXD1	SIO	COM1 Serial Port, TXD Pin
23	CTS1	SIO	COM1 Serial Port, CTS Pin
24	RTS1	SIO	COM1 Serial Port, RTS Pin
25	DCD1	SIO	COM1 Serial Port, DCD Pin
26	DSR1	SIO	COM1 Serial Port, DSR Pin
27	DTR1	SIO	COM1 Serial Port, DTR Pin
28	RI1	SIO	COM1 Serial Port, RI Pin
29	RESIN	RESET	Reset Input
30	TX+	LAN	Ethernet Interface, TX+ Pin
31	TX-	LAN	Ethernet Interface, TX- Pin
32	GND	----	Ground

Table 8-1: ADNP/1520 Pinout – Pin 1 to 32

The PIO pins 1 to 20 are driven by an in-system programmable (ISP) high density PLD (ispMACH256 or similar). It is possible to change the function of these pins over the ADNP/1520 JTAG interface. Please contact our support staff for more information.

Appendix 1: Pin Assignment –128-pin QIL Connector (2. Part)

Pin	Name	Group	Function
33	RX+	LAN	Ethernet Interface, RX+ Pin
34	RX-	LAN	Ethernet Interface, RX- Pin
35	RESOUT	RESET	Reset Output
36	VBAT	PSP	SC520 Real Time Clock Battery Input
37	CLKOUT	PSP	Clock Output (Default 1.8432 MHz)
38	TXD2	PSP	COM2 Serial Port, TXD Pin
39	RXD2	PSP	COM2 Serial Port, RXD Pin
40	INT5	PSP	Programmable Interrupt Input 5
41	INT4	PSP	Programmable Interrupt Input 4
42	INT3	PSP	Programmable Interrupt Input 3
43	INT2	PSP	Programmable Interrupt Input 2
44	INT1	PSP	Programmable Interrupt Input 1
45	CS4	PSP	Programmable Chip Select Output 4
46	CS3	PSP	Programmable Chip Select Output 3
47	CS2	PSP	Programmable Chip Select Output 2
48	CS1	PSP	Programmable Chip Select Output 1
49	IOCHRDY	PSP	I/O Channel Ready
50	IOR	PSP	I/O Read Signal, I/O Expansion Bus
51	IOW	PSP	I/O Write Signal, I/O Expansion Bus
52	SA3	PSP	System Expansion Bus, Address Bit 3
53	SA2	PSP	System Expansion Bus, Address Bit 2
54	SA1	PSP	System Expansion Bus, Address Bit 1
55	SA0	PSP	System Expansion Bus, Address Bit 0
56	SD7	PSP	System Expansion Bus, Data Bit 7
57	SD6	PSP	System Expansion Bus, Data Bit 6
58	SD5	PSP	System Expansion Bus, Data Bit 5
59	SD4	PSP	System Expansion Bus, Data Bit 4
60	SD3	PSP	System Expansion Bus, Data Bit 3
61	SD2	PSP	System Expansion Bus, Data Bit 2
62	SD1	PSP	System Expansion Bus, Data Bit 1
63	SD0	PSP	System Expansion Bus, Data Bit 0
64	Vcc	PSP	3.3 Volt Power Input

Table 8-2: ADNP/1520 Pinout – Pin 33 to 64

Appendix 1: Pin Assignment –128-pin QIL Connector (3. Part)

Pin	Name	Group	Function
65	SBHE	PSP	System Byte High Enable, Sys. Exp. Bus
66	IOCS16	PSP	I/O Chip Select 16, Sys. Expansion Bus
67	MEMCS16	PSP	Memory Chip Select 16, Sys. Exp. Bus
68	MEMW	PSP	Memory Write Signal, Sys. Expansion Bus
69	MEMR	PSP	Memory Read Signal, Sys. Expansion Bus
70	BALE	PSP	Bus Address Latch Enable, Sys. Exp. Bus
71	AEN	PSP	Address Enable Signal, Sys. Expansion Bus
72	Reserved	PSP	Reserved. Don't use
73	RCME	PSP	Remote Console Mode Enable
74	Reserved	PSP	Reserved. Don't use
75	Reserved	PSP	Reserved. Don't use
76	Reserved	PSP	Reserved. Don't use
77	Reserved	PSP	Reserved. Don't use
78	Reserved	PSP	Reserved. Don't use
79	Reserved	PSP	Reserved. Don't use
80	Reserved	PSP	Reserved. Don't use
81	Reserved	PSP	Reserved. Don't use
82	Reserved	PSP	Reserved. Don't use
83	Reserved	PSP	Reserved. Don't use
84	Reserved	PSP	Reserved. Don't use
85	INT6	PSP	Programmable Interrupt Input 6
86	INT7	PSP	Programmable Interrupt Input 7
87	IDERES	PSP	IDE Interface Reset Output
88	IDECS0	PSP	IDE Interface Chip Select 0
89	IDECS1	PSP	IDE Interface Chip Select 1
90	Reserved	PSP	Reserved. Don't use
91	Reserved	PSP	Reserved. Don't use
92	Reserved	PSP	Reserved. Don't use
93	Reserved	PSP	Reserved. Don't use
94	Reserved	PSP	Reserved. Don't use
95	Reserved	PSP	Reserved. Don't use
96	GND	---	Ground

Table 8-3: ADNP/1520 Pinout – Pin 65 to 96

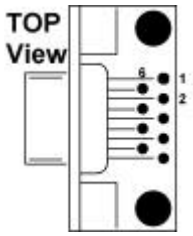
Appendix 1: Pin Assignment –128-pin QIL Connector (4. Part)

Pin	Name	Group	Function
97	LANLED	PSP	LAN Interface Activity LED
98	Reserved	PSP	Reserved. Don't use
99	RSTDRV	PSP	Reset Output, System Expansion Bus
100	SA23	PSP	System Expansion Bus, Address Bit 23
101	SA22	PSP	System Expansion Bus, Address Bit 22
102	SA21	PSP	System Expansion Bus, Address Bit 21
103	SA20	PSP	System Expansion Bus, Address Bit 20
104	SA19	PSP	System Expansion Bus, Address Bit 19
105	SA18	PSP	System Expansion Bus, Address Bit 18
106	SA17	PSP	System Expansion Bus, Address Bit 17
107	SA16	PSP	System Expansion Bus, Address Bit 16
108	SA15	PSP	System Expansion Bus, Address Bit 15
109	SA14	PSP	System Expansion Bus, Address Bit 14
110	SA13	PSP	System Expansion Bus, Address Bit 13
111	SA12	PSP	System Expansion Bus, Address Bit 12
112	SA11	PSP	System Expansion Bus, Address Bit 11
113	SA10	PSP	System Expansion Bus, Address Bit 10
114	SA9	PSP	System Expansion Bus, Address Bit 9
115	SA8	PSP	System Expansion Bus, Address Bit 8
116	SA7	PSP	System Expansion Bus, Address Bit 7
117	SA6	PSP	System Expansion Bus, Address Bit 6
118	SA5	PSP	System Expansion Bus, Address Bit 5
119	SA4	PSP	System Expansion Bus, Address Bit 4
120	SD15	PSP	System Expansion Bus, Data Bit 15
121	SD14	PSP	System Expansion Bus, Data Bit 14
122	SD13	PSP	System Expansion Bus, Data Bit 13
123	SD12	PSP	System Expansion Bus, Data Bit 12
124	SD11	PSP	System Expansion Bus, Data Bit 11
125	SD10	PSP	System Expansion Bus, Data Bit 10
126	SD9	PSP	System Expansion Bus, Data Bit 9
127	SD8	PSP	System Expansion Bus, Data Bit 8
128	Vcc	---	3.3 Volt Power Input

Table 8-4: Pin assignment ADNP/1520 pin 97 to 128

Appendix 2: Pin Assignment DNP/EVA2-SV4 Components

COM1 Connector



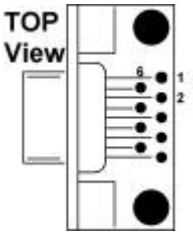
Pin	Signal
1	DCD
2	RxD
3	TxD
4	DTR
5	GND

Pin	Signal
6	DSR
7	RTS
8	CTS
9	RI

Table A2-1: Pinout COM1 Connector

Caution: All COM1-port signals are on RS232 level. There is no TTL level available on these ports. The RS232 level shifter is part of the DNP/EVA2-SV4 board.

COM2 Connector



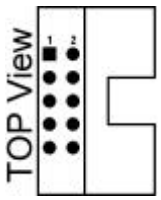
Pin	Signal
1	DCD
2	RxD
3	TxD
4	DTR
5	GND

Pin	Signal
6	DSR
7	RTS
8	CTS
9	RI

Table A2-2: Pinout COM2 Connector

Please Note: All COM2-port signals are on RS232 level. There is no TTL level available on these ports. The RS232 level shifter is part of the DNP/EVA2-SV4 board.

COM3 Connector (RS232/RS485)



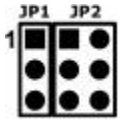
Pin	Signal
1	DCD
3	RxD*
5	TxD*
7	DTR
9	GND

Pin	Signal
2	DSR
4	RTS
6	CTS
8	RI
10	

Table A2-3: Pinout COM3 Connector

***:** As default all COM3-port modem signals are on RS232 level. In addition to their adjustment the RxD and TxD signals are either on RS232 or on RS485 level.

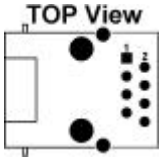
COM3 RS232/485 Switch



Jumper JP1	Jumper JP2	Function
1-2	1-3 and 2-4	COM3 uses RS232 Protocol
2-3	3-5 and 4-6	COM3 uses RS485 Protocol

Table A2-4: COM3 RS232/485 Switch

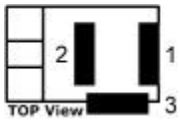
10/100 Mbps Ethernet Connector



Pin	Name	Signal
1	TX+	TXD+
2	TX–	TXD–
3	RX+	RXD+
4	nc	---
5	nc	---
6	RX–	RXD–
7	nc	---
8	nc	---
S1..2	Shield	---

Table A2-5: Pinout 10/100 Mbps Ethernet Connector

Power Connector



Pin	Name	Signal
1	VCC	Power In
2	GND	Power
3	GND	Power

Table A2-6: Pinout Power Connector

RCM Jumper

Jumper JP3	Function
open	Disable RCM mode for ADNP/1520
close	Enable RCM mode for ADNP/1520

Table A2-7: RCM Jumper Settings

Appendix 3: Using the Chip-Selects

The chip-selects on the ADNP/1520 have no default configuration so it is possible to make different user specific settings.

The chip-selects and **PAR**-areas (**P**rogrammable **A**ddress **R**ange) of the ADNP/1520 are mapped as shown in the following table. This table shows the allocation between the internal chip-selects and the chip-select lines on the Elan SC520.

ADNP CS	CS-Line (Elan)	PAR
CS1	$\overline{\text{GPCS2}}$	PAR0
CS2	$\overline{\text{GPCS3}}$	PAR1
CS3	$\overline{\text{GPCS4}}$	PAR2
CS4	$\overline{\text{GPCS5}}$	PAR3

Table A2-8: Chip-Select Mapping

Register	Mnemonic	MMCR Offset Addr.
Progr. Addr. Region0	PAR0	88h
Progr. Addr. Region1	PAR1	8Ch
Progr. Addr. Region2	PAR2	90h
Progr. Addr. Region3	PAR3	94h

Table A2-9: Address Decoding Registers–Memory-Mapped

Note: For further information please look at chapter 4 of the AMD Elan SC520 Microcontroller User's Manual and the AMD Elan SC520 Microcontroller Register Set Manual page 2-5.

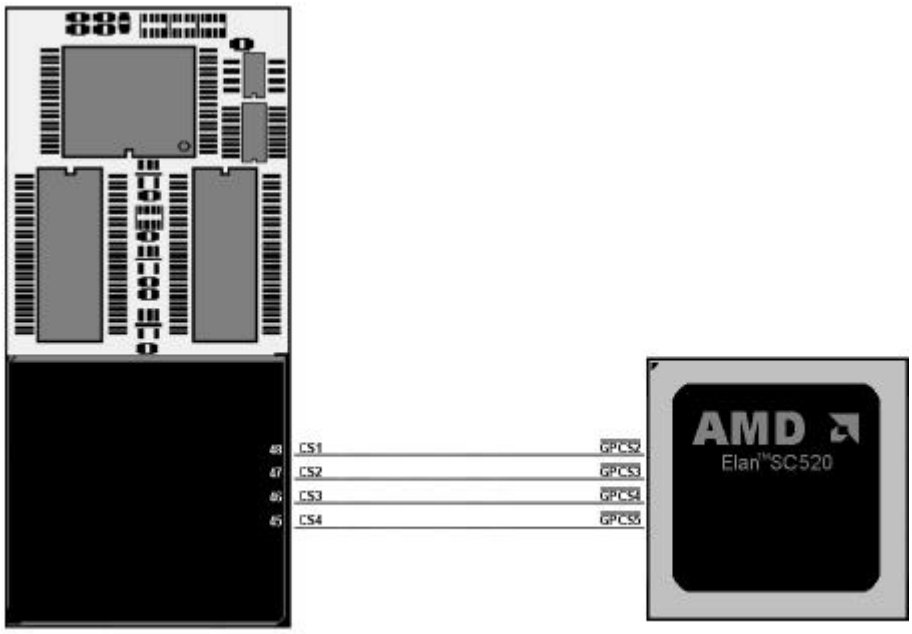


Figure 8-1: Chip-Select Allocation

Please pay attention to the following information:

All configuration registers that do not reside in PC/AT I/O space or PCI configuration space are memory-mapped and are located in a 4-Kbyte region in memory address space from FFFEF000–FFFEFFFFh (default setting).

- This 4-Kbyte region is called the memory-mapped configuration region (MMCR).
- The MMCR can optionally be relocated on any 4-Kbyte boundary in the lower 1-Gbyte region via an I/O mapped register called the Configuration Base Address (CBAR)register (Port FFFCh).
- The default MMCR region in high memory (below the boot space) is visible even if it is aliased via the Configuration Base Address (CBAR) register.

Note: The MMCR (Memory Mapped Configuration Range) of the ADNP/1520 is default mapped by the BIOS to the physical address FD000h (FD00:0000). This makes it easy to access the MMCR from DOS. Alternatively it is possible to use the default address space that were mentioned above.

The following examples will show you how to programm a chip-select.

PAR Example:

Address MMCR PAR0 = FD000h + Offset 88h -> FD088h
Address MMCR PAR1 = FD000h + Offset 8Ch -> FD08Ch
Address MMCR PAR2 = FD000h + Offset 90h -> FD090h
Address MMCR PAR3 = FD000h + Offset 94h -> FD094h

Chip-Select Example:

CS1# (GPCS2#) : IOCS at 0x100...0x107 –> PAR0 = **0x28070100**

CS2# (GPCS3#) : IOCS at 0x340...0x34F –> PAR1 = **0x2C0F0340**

CS3# (GPCS4#) : IOCS at 0x360...0x360 –> PAR2 = **0x30000360**

CS4# (GPCS5#) : MEMCS at 0x20000000...0x2007FFFF–> PAR3 = **0x5601E000**

Example: This program shows how to access the MMCR PAR0 from DOS to program CS1 as IOCS at 0100h–0107h

```
mov  ax,  0FD00h
mov  es,  ax
mov  eax, 28070100h
mov  es:  [88h],eax
```

Appendix 4: Connecting an external battery to the ADNP/1520

To ensure the RTC (Real Time Clock) function of the ADNP/1520 when the main power is removed, an backup battery must be connected between VBAT (Pin36) and GND. This backup battery should be a lithium battery with a maximum current of approx. 3VDC. The power consumption of the ADNP/1520 has an amount of about 7µA. If mainpower is turned on–no battery power will be consumed.

Appendix 5: Mechanical Dimensions

The ADNP/1520 uses a 128-pin QIL socket as mechanical base. The figure 50 shows the dimensions. All length dimensions have a tolerance of 0.5 mm.

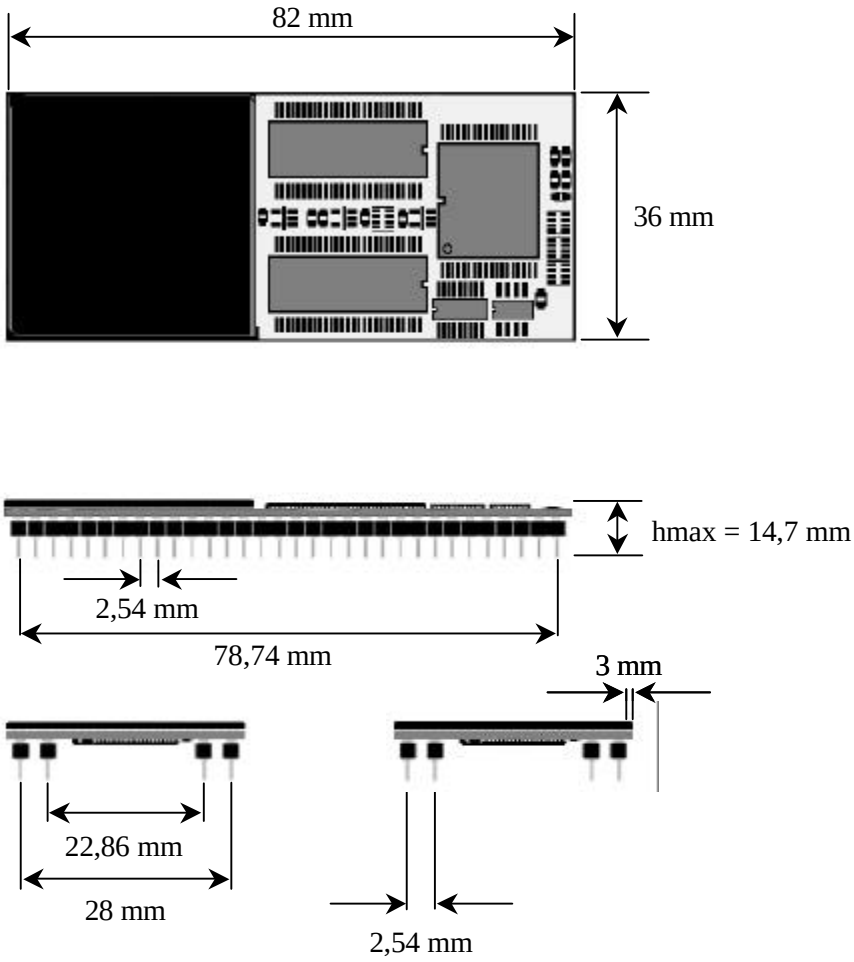


Figure A5-2: Dimensions of the ADNP/1520

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